Ex-CIO tells how to turn around a failing IT department. PAGE 44 Feds don't plan to impede offshore outsourcing. PAGE 7

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Coders Face Nontech Hurdles

Service-oriented tack creates people, process challenges

BY CAROL SLIWA
LOS ANGELES

Technology issues are only one of the hurdles confronting companies that are adopting or considering a service-oriented approach for their development work.

INSIDE
Merrill Lynch explains its service-oriented approach. Page 16

IT managers attending Gartner Inc.'s Application Development Summit here last week said they face equal if not greater challenges in marshalling their personnel and processes as they lay the foundations for service-oriented architectures.

"For a large shop with a variety of tools, how do you get standardization in development efforts? How do you make people receptive to all these changes? How do you put some order in the process?" asked Ulma Gonzalez, director of the application development division in the e-government department of Miami-Dade County in Florida.

Gonzalez said the county has just started down a ser-

Architecture, page 16

Anti-Microsoft Security Report Mired in Politics

@stake fires CTO for co-authoring document; impartiality of researchers, backers challenged

BY DAN VERTON
WASHINGTON

A report that might have been a valuable contribution to the study of the security ramifications of monolithic IT infrastructures has instead become a pawn in the unending political battle between pro- and anti-Microsoft factions. And it has cost one of the co-authors his job.

The controversy stems from a report released Sept. 24 by seven self-proclaimed independent researchers from the IT security industry that harshly criticized Microsoft Corp.'s monopoly hold on the software industry. That hold is a fundamental cause of security problems that now confront the global Internet community, the report contends.

YOU JUDGE
To read the report in question, visit our Web site.
QuickLink a3640
computerworld.com

The day after the report's release, co-author Dan Geer was fired from his job as chief technology officer at Cambridge, Mass.-based @stake Inc., a security company that derives a hefty percentage of its income from Microsoft. Moreover, the firing was made retroactive to Sept. 23 so that @stake could further distance itself from Geer and the report, sources close to the situation said.

An @stake official, who spoke on condition of anonymity, confirmed that Geer was fired and said that as a corporate officer he should have known that Microsoft was a client of the company. "It's not a matter of the content of the report; it's a matter of ethics and respect for clients," the official said.

Geer couldn't be reached for comment on Friday.

Chris Wysopal, @stake's director of research, said the company had no argument with the report's basic premise that technological diversity poses less of a security risk than monolithic architectures. "But the way the report is positioned and a lot of its conclusions are things we don't agree with. The report is a bit one-sided," he said.

In any case, the firing didn't go down well with other authors of the report.

"Its very sad that @stake fired him for this," said Bruce Schneier, a co-author and founder of Cupertino, Calif., security consultancy

Politics, page 53

UN Adopts ASP Model for ERP

Agency scraps system in favor of PeopleSoft in $27.5M global rollout

BY PATRICK THIBODEAU
NEW YORK

On Jan. 1, Norman Sanders, CIO of the United Nations Development Program, will take his global IT infrastructure from a once-a-month reporting system to a round-the-clock operation. It's a change that will affect 7,500 users, and Sanders knows exactly how many days remain until the switch takes place.

When that day arrives, "my heart is going to be in my mouth, I assure you," he said. And that will be true for some others at the agency "who have really put their necks and careers on the line," Sanders said.

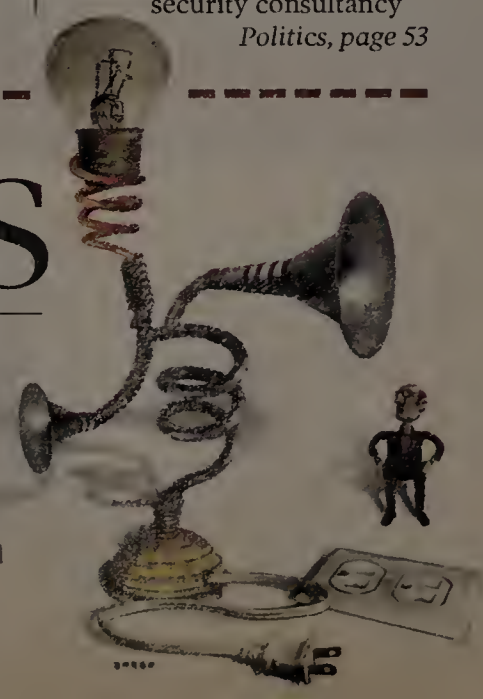
The UNDP, the UN agency that runs development pro-

United Nations, page 53

> **"What I would have preferred would have been a risk-free option. The [situation] was, take your pick as to which risk you want."**
>
>
>
> NORMAN SANDERS, CIO, UNDP

InnovationInterruptus

Several years of budget cuts have unplugged many of the most innovative IT development projects, a Computerworld survey shows. But some pockets of creativity remain, especially at longtime IT leaders such as Wal-Mart, FedEx and UPS. **Page 41**



RICHARD BORGE

NEWSPAPER

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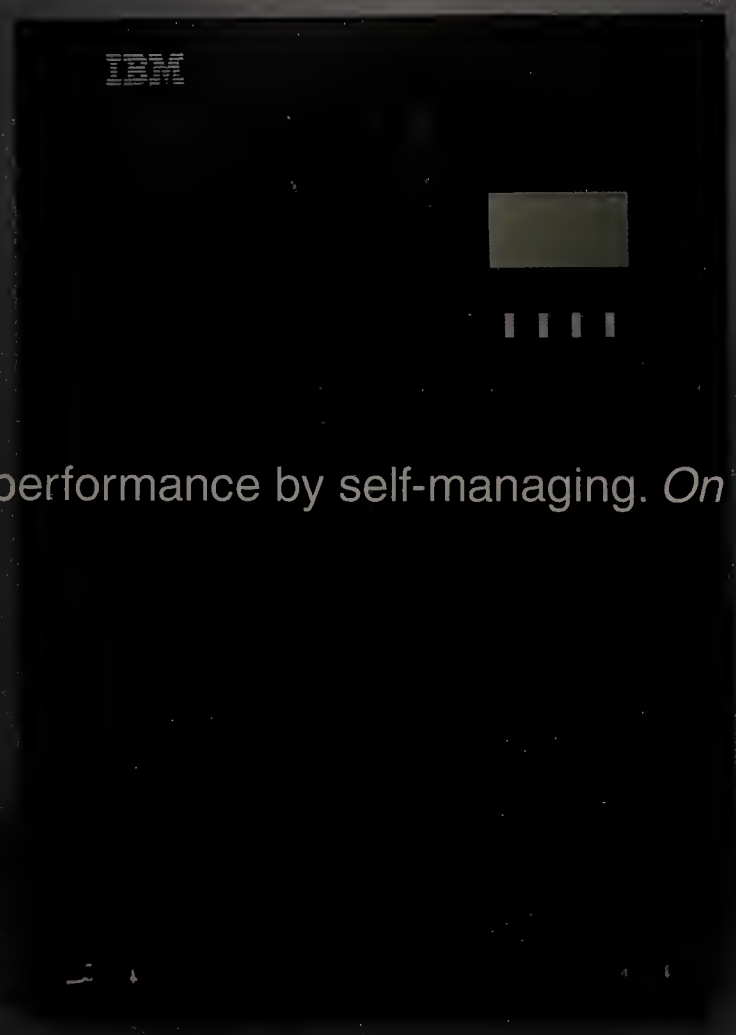

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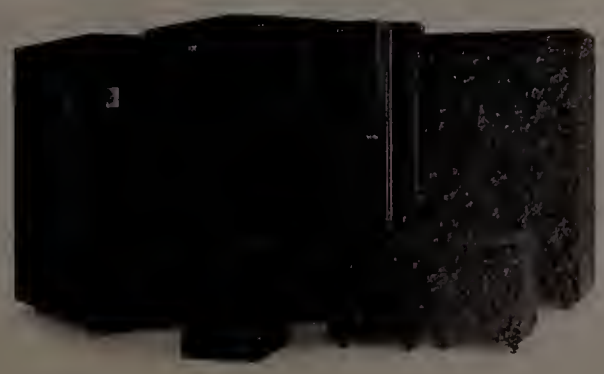

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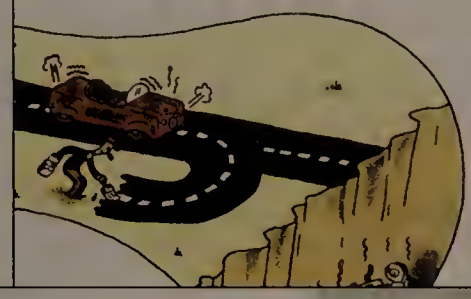

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Lessons Learned From Blaster

SECURITY: Columnist Peter H. Gregory shares advice from companies that weren't prepared for Blaster. **QuickLink 41167**

Keep Information Secure Beyond Data Center Walls

SECURITY: Hackers don't need to target big corporate systems to cause trouble, notes Sun's Brad Powell. He offers advice on reducing the risks of remote computing. **QuickLink 40187**

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DEVELOPMENT: Get projects done on time and within budget using these 10 simple tips. **QuickLink 41546**

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STORAGE: Progressive technology takes some of the repetition out of backups and simplifies storage management, says Tivoli's Laura Sanders. **QuickLink 41079**

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AT DEADLINE

IBM Cuts Jobs at Software Unit . . .

IBM said it's laying off about 380 U.S. workers in its software division in an effort to eliminate overlapping jobs and increase the unit's efficiency. The cuts, which are due to be completed within 30 days, will reduce the software division's workforce by 1%. Customer-facing jobs won't be affected, IBM said, noting that the layoffs will mostly affect marketing and administrative positions.

. . . And Expands Claims Against SCO

In other IBM news, the company expanded a Linux-related countersuit against The SCO Group Inc. by claiming that SCO has infringed its technology copyrights. IBM, which countersued last month after being sued by SCO in March, charged in the new filing that SCO distributed IBM-developed Linux technology without permission. Lindon, Utah-based SCO denied the claims. (See related stories, page 8.)

HP to Downsize Its Utility IT Tools

Hewlett-Packard Co. said it's developing a slimmed-down version of its Utility Data Center (UDC) software, a set of utility computing tools for managing IT resources. The software will be aimed at midsize companies and departmental users and will start at about $100,000, compared with an $800,000 base price for the full-function UDC. The new software should ship next year.

Lawson to Acquire Two Companies

Lawson Software in St. Paul, Minn., said it's buying Apexion Technologies Inc., a San Francisco-based vendor of mobile health care applications, and Closedloop Solutions Inc., a Redwood City, Calif.-based maker of collaborative budgeting tools.

3Com Launches WAN Routers Based on Huawei's Technology

Vendor broadens reliance on partners

BY MATT HAMBLEN

NETWORKING vendor 3Com Corp. today will introduce its first WAN router line. The new products are made by Chinese vendor Huawei Technologies Co., a move that highlights 3Com's increasing reliance on business partners and operations in Southeast Asia for technology development and product manufacturing.

NETWORK CENTRAL
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QuickLink k1200
www.computerworld.com

The rollout of the Router 5000 series for midsize users and branch offices of larger companies follows 3Com's announcement earlier this month that it plans to outsource all manufacturing of its enterprise networking products. 3Com, which will lay off about 1,000 of its 3,100 workers as a result of the outsourcing decision, also said it's shifting development of low-end volume products to a new facility in Taiwan.

The Marlboro, Mass.-based company is trying to regain its position as a leading vendor of corporate networking equipment after temporarily abandoning that market three years ago. But 3Com faces stiff competition from bigger rivals like Cisco Systems Inc., and it's trying to rebound from losses that totaled $283.8 million in its last fiscal year and $106 million in its fiscal 2004 first quarter, which ended Aug. 29.

Several 3Com users last week said they were mostly unconcerned about the restructuring program, adding that they hope the ongoing changes help strengthen the vendor. The users also welcomed the arrival of the Router 5000 family and said they trusted the pairing between 3Com and Huawei.

"I want [3Com] to do well, because we want to use them," said Sean McRae, CIO at Prudential Northwest Properties, a Portland, Ore.-based real estate brokerage that has 19 offices and 750 employees.

McRae plans to look closely at the new router line as a potential alternative to Cisco's products. "From a cost perspective, it sounds terrific," he said. "The fact that Huawei builds in China is not a concern as much, since we would have support from 3Com."

Ted Malos, director of technology at the Ventura Unified School District in Ventura, Calif., said he also will evaluate the Huawei-built routers to see if they would integrate easily into his network, which connects 27 school sites and includes IP phones and other equipment made by 3Com. The 5000 series "sounds like a Cisco replacement" because of its low cost and promises of high reliability, Malos said.

3Com said CEO Bruce Claflin and other top executives weren't available last week to discuss the company's strategy. In a statement issued Sept. 18, when 3Com reported its first-quarter results, Claflin highlighted the company's plan to set up a joint venture with Shenzhen, China-based Huawei and a voice-over-IP deal that it announced last month with Aspect Communications Corp. in San Jose.

"While it would be premature to suggest an industry or company turnaround, we are encouraged," Claflin said, noting that 3Com began its new fiscal year "with an expanded set of products [and] an enhanced set of partners."

Despite its losses, 3Com still has $1.5 billion in cash. And the company's recent moves should help make it stronger over time, said Zeus Kerravala, an analyst at The Yankee Group in Boston. Kerravala said that Huawei "makes decent products" and that shifting some of 3Com's engineering work to China is a sensible plan. "You can save a lot by replacing a $150,000 engineer in the U.S. with a $25,000 engineer in China," he noted.

But Wesley Cummins, a financial analyst at B. Riley & Co. in Los Angeles, was skeptical about 3Com's prospects. "It was a mistake to set up the joint venture," he said. "We don't think there's room for another vendor in the high-end router space." **41657**

3Com's Outside Help

HUAWEI TECHNOLOGIES: The two companies are **setting up an enterprise networking joint venture,** and 3Com has started buying routers and switches made by Huawei.

ASPECT COMMUNICATIONS: Aspect **plans to resell 3Com's VoIP technology** for use with its call center applications.

FLEXTRONICS INTERNATIONAL LTD. AND JABIL CIRCUIT INC.: They will **take over all manufacturing of 3Com's** high-end networking products under separate outsourcing deals, and Flextronics will handle global distribution.

New Product Line Offers Four Devices to Users

3Com said the Router 5000 product line that it plans to introduce today includes four devices priced from $1,395 to $6,495 that are scheduled to ship next week.

Nick Tidd, 3Com's director of market strategies for the Americas region, said the company in late November plans to add a set of network management tools for the routers. The Network Administrator software, which was written by developers at 3Com, will work in conjunction with Hewlett-Packard Co.'s OpenView management technology, said Tidd.

Wendy Neuzil, network administrator for the Cedar Rapids Community Schools in Cedar Rapids, Iowa, said one of the new routers worked successfully in tests earlier this month, matching or exceeding the performance of a comparable product from Cisco.

The school district will soon issue a request for bids on a planned purchase of 34 edge routers, and Neuzil said she plans to recommend that it buy the 3Com equipment.

The router family is the second Huawei-developed technology announced by 3Com. The first was a core LAN switch that was released in July. A Hong Kong-based joint venture being formed by the two companies will develop products and sell them in China and Japan, with 3Com handling sales in the U.S. and the rest of the world.

Under the plan, which was announced in March, 3Com will contribute $160 million and about 50 employees to the joint venture, while Huawei will transfer 1,000 workers and license some of its LAN switching and routing technology to the new company.

– Matt Hamblen

Bush Administration Won't Impede Offshore Outsourcing

Positive effects such as increase in productivity cited

BY PATRICK THIBODEAU
NEW YORK

IT WORKFORCE

Although the Bush administration sees pros and cons in the trend toward offshore outsourcing, it has no plans to impede companies' efforts to move IT jobs to India or elsewhere. Instead, it plans to focus on developing an economic climate that helps create jobs in the U.S., an administration official said last week.

"The answer to economic challenges is growth and innovation," said Chris Israel, a deputy assistant secretary at the U.S. Department of Commerce, speaking at an IT services outsourcing symposium here. He cited the administration's support for increased investment in research and development, education and expanded trade authority for the president as examples of its efforts to improve growth.

If it chose to do so, the White House could create obstacles for U.S. companies that want to move work overseas. It could use its power over regulated industries, such as financial services, to discourage sending work offshore by raising national security concerns. It could also set "buy American" standards for government purchases of IT products or back legislation in Congress to restrict visas such as the L-1, which multinational companies use to facilitate offshore development.

Israel said he understands the ramifications of offshore outsourcing, such as downward pressure on salaries in the IT industry and the potential for a "reverse brain drain," where highly skilled IT workers choose to work in countries other than the U.S. But he also noted that offshore development could have positive effects, such as driving prices down and productivity up.

Although the Bush administration may be on the fence about the effects of offshore outsourcing, Phil Friedman, CEO of Computer Generated Solutions Inc., is not. He opposes moving jobs offshore. Friedman said his company, a New York-based systems integrator and managed services provider, recently opened a technical services center in Atlanta. The company had to fill 300 positions at the new facility, and it received 3,000 applications for those jobs in three days.

"That tells me the story," said Friedman. "We have plenty of talent, so we are not moving jobs [offshore] because we cannot find talent or we don't have the quality of talent in this country. But I'm wondering [if] in the rush to send jobs offshore, we, in some respects, are neglecting the moral responsibility we have with our employees.

FRIEDMAN wonders if U.S. companies are neglecting their moral responsibility to employees.

"We need those technology skills. This country is making productivity gains only because of the technology we've been able to implement, and all of a sudden we are abandoning those employees, and it's bothersome," said Friedman.

Countering that view was Gordon Coburn, senior vice president and chief financial officer at Cognizant Technology Solutions Corp., a Teaneck, N.J.-based offshore services provider, who said offshore work allows businesses to remain competitive.

"For a U.S. company to take the approach that 'No, I have to do it all here because I have to protect the jobs,' in the end, it's going to cost more jobs here because they're not going to survive, because they won't be price-competitive," said Coburn. "On a long-term basis, I think that by our clients leveraging the offshore model, they are actually protecting American jobs."

Israel said it's difficult to distinguish the number of IT jobs lost as a result of offshore outsourcing from those lost because of the industry downturn. He said there isn't "statistical data that shows one-to-one correlations."

Priscilla Tate, director of the Technology Managers Forum, a New York-based group representing IT executives at large companies, said offshore development is taking a toll on U.S. workers. "Higher-skilled jobs are going away," she said. "There are people who will not get jobs in the IT industry again — they just have been replaced." 41662

CAREER MOVE
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www.computerworld.com

Oracle Deal With Energy Dept. Yields New Security Model

Benchmark could keep application vendors in security loop following sale

BY DAN VERTON

Last week's announcement by the U.S. Department of Energy that it will require Oracle Corp. to deliver software that's configured for optimal security and then provide immediate postdeployment support for security patches may signal the beginning of a dramatically different security model for the government and industry, security experts said.

The potential shift stems from the government's push to use a new security configuration benchmark developed by the Center for Internet Security (CIS) to test and certify Oracle database versions 8i and 9i running on Windows and Unix [QuickLink 41553].

The benchmark, developed with dozens of Oracle software users and the SANS Institute through the CIS, will be available to anyone, free of charge, at the CIS Web site.

"Oracle not only agreed to deliver a safely configured system but also to deliver hot fixes and patches automatically and to ensure that none of those fixes undoes the security settings," said Alan Paller, director of research at the Bethesda, Md.-based SANS Institute. This solves two huge problems for software buyers, said Paller, because they will no longer have to search for patches and they will no longer have to test patches to determine whether they would unravel other key security settings.

In fact, the DOE will now receive data on bugs and fixes through an internal, Oracle-run automated bug-tracking system. Through this system, the company will automatically deliver patches to a central server at the DOE.

The agency signed a separate contract with Sunnyvale, Calif.-based Opsware Inc. to ensure that every DOE system has the most up-to-date configuration of Oracle software, thereby enabling patches to proliferate automatically throughout the network.

Providing Guidelines

Tim Hoechst, Oracle's senior vice president of technology for government, education and health care, said the release of the CIS-developed Oracle benchmark in conjunction with the DOE contract is designed to ensure that customers configure their software properly so they can take full advantage of the security features.

> **"Oracle not only agreed to deliver a safely configured system but also to deliver hot fixes and patches automatically and to ensure that none of those fixes undoes the security settings."**
>
> **ALAN PALLER,** DIRECTOR OF RESEARCH, SANS INSTITUTE

"We're not just throwing the locks over the fence — we're climbing over the fence with our locks," he said. "Designing our products with secure functionality does not necessarily mean our customers take advantage of that functionality. What this does is produce guidelines for how to best use the technology."

Clint Kreitner, president and CEO of CIS, said that until now, much of the focus has been on influencing operating system vendors to improve security and support.

The next phase, heralded by the Oracle benchmark, is to focus on application vendors, he said. "People don't buy computers around operating systems," Kreitner said. "They buy them around applications." The DOE's contract with Oracle is something other agencies and companies should consider emulating, he added. 41700

BRIEFS

Sun Details New Chip Technology

Sun Microsystems Inc. said it has developed "proximity communication" technology that lets computer chips exchange data without being physically connected by pins and wires. The approach could be used to eliminate or modify the printed circuit boards now used in systems. But Sun said it still needs to prove that devices supporting the new technique can be produced in volume.

Microsoft Releases 64-bit Win XP Beta

Microsoft Corp. released a 64-bit version of Windows XP for beta-testing on desktop PCs and workstations that use processors from Advanced Micro Devices Inc. Microsoft said the beta release supports AMD's Opteron chip and its Athlon 64 device, which was announced last week. The software is due to ship by mid-2004, as is a 64-bit version of Windows Server 2003.

Intel Adds Mobile Threading Support

Intel Corp. introduced four versions of its Mobile Pentium 4 processor that support the hyper-threading technology already used on some of the company's chips for servers and desktop PCs. The feature should improve the performance of multimedia applications on notebook PCs, Intel said. Dell Inc. announced that it's adding one of the new chips to its Inspiron 5150 system.

Short Takes

In other INTEL news, the company said it has has paid $450 million to buy a 5.3% stake in Micron Technology Inc., a Boise, Idaho, maker of memory chips. . . . Handheld vendor RESEARCH IN MOTION LTD. in Waterloo, Ontario, became profitable in its second quarter, which ended Aug. 30, with earnings of $2.1 million.

HP to Indemnify Users Against SCO Legal Action

Says it will defend its Linux customers if they're sued and pay any damages

BY TODD R. WEISS

HEWLETT-PACKARD Co. last week said it will indemnify companies running Linux on its servers against any future legal action taken by The SCO Group Inc. as part of its campaign against the open-source operating system.

Eric Raymond, president of the nonprofit Open Source Initiative research group, said Linux users should view HP's promise to defend its customers in court and cover any damages or other legal ramifications as a positive sign.

"It demonstrates that HP doesn't think SCO has a legal leg to stand on," he said. "If they thought they'd have to pay off on that indemnity, they wouldn't have offered it."

Joe Poole, manager of technical support at Boscov's Department Store LLC in Reading, Pa., called the pledge "one more layer of protection" for HP users. But Poole added that even if he received such a promise from IBM, his hardware vendor, he wouldn't be convinced that Boscov's was safe from legal threats as long as the suit SCO filed against IBM in March was pending.

Nothing to Fear

But Kyle Arteaga, a spokesman for London-based Reuters Group PLC, said that HP's announcement was a noteworthy step for customers who run the Reuters Market Data System software on Linux-based HP ProLiant servers. "Anything that may remove any fear on our customers' part is a good thing," he said.

Lindon, Utah-based SCO claims that Linux is "an unauthorized derivative of Unix," and it has put Linux users on notice that it might sue them for copyright infringement if they don't license its Unix technology.

Martin Fink, vice president of Linux enterprise servers and storage at HP, said during a press conference last week that the indemnification "is about accountability and protecting the customer. We're giving the green light to customers to move forward on their Linux deployments."

ALL THE DETAILS

For full coverage of the SCO/Linux controversy, go to our Web site:
QuickLink a3260
www.computerworld.com

The indemnification offer will take effect Oct. 1 for users who buy Linux on HP hardware and sign an addendum to their contracts. Fink said existing customers will also be able to sign up as long as they obtained their Linux distribution through HP and have standard support contracts.

Other scenarios, such as users who want to be indemnified for running a Linux distribution acquired from another vendor on HP's hardware, can be discussed on a case-by-case basis, he added.

HP's indemnification plans "reaffirm the fact that enterprise end users running Linux are exposed to legal risks," Darl McBride, SCO's president and CEO, said in a statement.

CHECKLIST

HP's Linux

To be indemnified by HP against possible legal action by SCO, users must:

- Obtain their Linux operating system through HP.
- Run the Linux software on HP's hardware.
- Sign a support contract addendum with the company.

"Rather than deny the existence of substantial structural problems with Linux, as many open-source leaders have done, HP is acknowledging that issues exist."

IBM spokesman Mike Darcy countered that the indemnification offer appears "to flow from the belief that SCO's claims against Linux are baseless. We agree." But Darcy wouldn't say if IBM is considering a similar move to indemnify its Linux users. 41693

Red Hat Enterprise Linux Upgrade Due Next Month

Release increases scalability, supports 16 processors

BY TODD R. WEISS

Red Hat Inc. will release a new version of its enterprise Linux operating system next month, marking the starting point of a product road map that the company detailed last week.

Red Hat Enterprise Linux 3 will add a default Logical Volume Manager for storage management, as well as support for the new Native Posix Threading Library. That means the operating system will support thousands of program-instruction threads rather than hundreds, making it more scalable and expanding its multitasking capabilities, according to Red Hat.

"That's really going to change the use of Linux for application servers," said Brian Stevens, vice president of operating systems development at the Raleigh, N.C.-based company.

A high-availability cluster component is expected for the operating system later this year, and integrated storage management and virtualization components will arrive by 2005, Stevens said.

Tom Pratt, information systems manager at Coastal Transportation Inc., said he has looked at the new Red Hat operating system and will eventually upgrade to it. The Seattle-based shipping company currently runs desktop versions of Red Hat Linux and is eager to take advantage of the enterprise version's longer release cycles and related ease of maintenance, Pratt said. Also attractive in the new operating system is its improved memory management, he said.

Enterprise Linux 3

Includes improved capabilities:

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The new operating system, which is based on the Linux 2.4.21 kernel, replaces the existing Red Hat Advanced Server product line and will support up to 16 CPUs and up to 64GB of memory. That's up from eight CPUs and 16GB of memory supported by the previous version.

The upcoming Linux Kernel 2.6 is still in the early stages of development and probably won't be included by Red Hat until the next version of the enterprise server operating system, Version 4, is released late next year, Stevens said. Work continues on Kernel 2.6 to give it support for thousands of SCSI devices, up from today's limit of 256, he said.

Pricing for the new operating system hasn't yet been announced. 41689

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New Owner Delays Baan ERP Upgrade

SSA executive says Baan lost touch with users, promises 'a solid product'

BY JORIS EVERS

SSA GLOBAL Technologies Inc. last week planned to demonstrate an early version of an ERP applications upgrade that's being developed by its Baan unit. But SSA, which took control of Baan in July, said it has delayed the release of the upgrade from this month to the second quarter of next year.

According to SSA, Baan has spent about $100 million on the software, which is code-named Gemini. But Graeme Cooksley, executive vice president of sales and marketing at Chicago-based SSA and Baan's new president, said Baan had lost touch with the needs of its users and neglected to integrate its CRM and logistics applications with Gemini.

Cooksley added that SSA, which held its annual user conference last week in Orlando, is committed to Gemini and will release the technology as "a solid product, with migration tools and the essential features and functions."

Wait and See

Keith Bearden, CIO at A-dec Inc., a maker of dental equipment in Newberg, Ore., said he plans to wait at least a couple of years before upgrading to Gemini from the Baan IV ERP applications he now uses. In the meantime, Baan needs to do a better job of supporting its users, he added.

"We've seen support become second fiddle to new development," Bearden said. "Baan spent more time on Gemini than they did integrating the products they already had." He noted that after A-dec ran into performance and integration problems with CRM applications it bought from Baan last year, its IT staff had to spend "a lot more time and money" than it expected to get the issues resolved.

Darren Symington, IT manager at MTM Pty., an auto parts maker in South Oakleigh, Australia, said his company is still satisfied with the 7-year-old Baan IV software. Switching to another ERP vendor would require a huge investment, he pointed out.

But Symington said that Cooksley "has to convince me that SSA is going to take care of the situation" at Baan. Delaying Gemini was a good start, he said, adding that shipping an incomplete version likely "would be the last nail in the coffin for Baan."

About 70% of Baan's 6,000 users are still running Baan IV, not its newer iBaan V software. If SSA botches the rollout of Gemini, it risks losing customers altogether, said Brian Zrimsek, a Gartner Inc. analyst in Pittsburgh.

Baan IV users "are nearing the end of the life cycle," Zrimsek said. "Given what Baan has been through, I don't think SSA can assume that they're just going to upgrade."

Barneveld, Netherlands-based Baan became a subsidiary of SSA in July after it was acquired by the two investment firms that jointly own SSA. Cooksley said Baan was in dire straits when it was handed to SSA, which itself is trying to rebound from years of financial problems by making a series of acquisitions (see box).

Baan lost $150 million last year and was "bloated," operating as if it had $500 million in annual revenue when the actual total was about half that, Cooksley said. But he predicted that Baan will become profitable again within three months, following the recent layoffs of 800 of its 2,800 workers. **41699**

Evers writes for the IDG News Service.

ALL TOGETHER

SSA plans to consolidate overlapping applications from its various software units:

QuickLink 41671
www.computerworld.com

Recent SSA Acquisitions

JUNE: Buys Ironside Technologies Inc., which sells software for business-to-business e-commerce.

JULY: Completes purchase of Elevon Inc., a maker of collaborative commerce applications.

AUGUST: Announces deal to buy EXE Technologies Inc., a developer of supply chain execution software.

ON THE MARK

[illegible] was on vacation last week. His column will return in next week's issue.

Oracle Readies CRM, Supply Chain Upgrades

BY MARC L. SONGINI

Oracle Corp. is adding automated configuration tools to its supply chain management applications and is developing an upgrade of its CRM software that's designed to make it easier for users to exchange customer data with other systems.

Oracle executives outlined the upgrade plans this month during a series of briefings at company headquarters in Redwood Shores, Calif. They said the new supply chain features will begin to ship by year's end. The new CRM offering is scheduled to follow by mid-2004.

Don Klaiss, senior vice president of manufacturing and supply chain applications at Oracle, said the configuration tools are being added in an effort to reduce the time it takes to install the supply chain software to days, instead of weeks or months.

For example, the new release will include a rules-based feature that poses questions to IT managers about their implementations and then helps set up software configurations, Klaiss said.

The new tools sound like they would be "absolutely useful," said Patrick Harris, director of IT at Sealing Devices Inc., a Lancaster, N.Y.-based maker of seals and gaskets. Harris said installing Oracle's CRM and supply chain applications at Sealing Devices was a daunting job because of their complexity.

"I'd rather have more wizards instead of sitting down with a 700-page manual," he noted. "There are lots of things to set up, and putting in an interface to make it easier and guide you will save lots of dollars."

Also on Oracle's To-Do List

- **Fully integrate** iLearning app and human resources software.
- **Add a reporting feature** based on Web services technology to iLearning so it can transmit data from other applications.
- **Upgrade** Daily Business Intelligence application with six new role-based views and support for analyzing data in additional functional areas, including fixed assets.

Preparing for RFID

Klaiss said Oracle has also started beta-testing new warehouse management applications that will be able to more effectively handle data generated by radio frequency identification (RFID) tags. In addition, the warehouse software will work with the company's Oracle Database 10g technology to provide load-balancing, reporting and data management functions for RFID uses.

Andrew Kass, vice president of CRM development at Oracle, said the company is tweaking the architecture of that product line to enable more rapid data sharing between different modules in its E-Business Suite 11i product line. For example, users could automatically mirror information about customer service work that had been completed from the CRM software to Oracle's manufacturing or supply chain applications, Kass said.

The CRM upgrade will also include new features aimed at boosting employee productivity and helping users proactively address potential problems with their customers, according to Kass. One such enhancement will let companies log in any repeated problems customers might have with a given product to help them avoid similar problems.

Victor Burgess, vice president and general manager of alliances at Peoria, Ill.-based Affina, said the CRM upgrade could help speed order-fulfillment processes at the company, which manages customer service outsourcing work.

Affina runs Oracle's CRM and application server software, but Burgess said users sometimes have to go through multiple steps to check product inventories. The more those processes can be standardized and automated, the better, he added. **41659**

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BRIEFS

Ohio State, IBM Sign Systems Deal

Ohio State University said it plans to buy $75 million worth of PCs and servers from IBM over the next three years. The contract includes purchases of IBM's Intel-based xSeries servers running both Linux and Windows, plus its ThinkCentre desktop PCs and ThinkPad notebook devices. Officials at the Columbus-based university said they hope to reduce IT costs by dealing with a single hardware vendor.

Symantec, Sophos Make Purchases

Security software vendors Symantec Corp. and Sophos PLC both announced acquisitions. Cupertino, Calif.-based Symantec said it agreed to buy PowerQuest Corp., a vendor of systems and storage management tools in Orem, Utah, for an undisclosed price. Abingdon, England-based Sophos said it has paid $23 million to purchase ActiveState Corp., a maker of antispam software in Vancouver, British Columbia.

IBM to Test IM Links With Reuters

Reuters Group PLC and IBM announced plans to test secure links that would let users of their instant messaging products communicate with each other. As part of the deal, London-based Reuters will offer its users a gateway to IBM's Lotus Instant Messaging software. Reuters and America Online Inc. announced a similar agreement earlier this month [QuickLink 41213].

Short Takes

VERIZON COMMUNICATIONS in New York and LEVEL 3 COMMUNICATIONS INC. in Broomfield, Colo., both cut their financial results forecasts. . . . INTEL CORP. and Cary, N.C.-based SAS INSTITUTE INC. today will detail plans to jointly develop data analysis tools for mobile users.

Users Mull Upgrade To Notes 6.5 Release

Added features, similarity to Microsoft Outlook could warrant move, they say

BY TODD R. WEISS

SOME OF THE new features in Version 6.5 of Lotus Notes and Domino, announced last week, are getting high marks from users tasked with determining whether those features warrant an upgrade.

Scott Melendez, principal information systems engineer for enterprise messaging for the city and county of San Francisco, said users who beta-tested the integrated Notes 6.5 e-mail and instant messaging (IM) client welcomed its similarity to Microsoft Corp.'s Outlook.

Among the popular additions is a follow-up folder into which a user can put incoming e-mails that require a response. Also getting high marks, he said, are new symbols that appear next to an e-mail when a user has responded to the message or forwarded it, making it easier to keep track of the status of messages.

"Those small things make a difference for end users" by aiding productivity and making e-mail chores easier, Melendez said. The addition of Outlook-like features is a welcome development, he said.

An IT manager at a large pharmaceutical company who asked not to be identified agreed that Notes 6.5 brings welcome updates. "We'll probably go with 6.5 on the client," she said.

She said a key new feature is the deep integration of e-mail with IM. The new built-in IM capabilities were formerly part of the separate Lotus Sametime application.

But for many users, the arrival of Version 6.5 is a non-event. Perry Hiltz, a systems engineer at consumer and industrial products manufacturer Henkel Corp. in Dusseldorf, Germany, said he's still working to roll out last year's Notes 6 upgrade to 35,000 global users and hasn't even had a chance to look at Notes 6.5. Henkel users are still running the Notes 5 client and won't begin moving to Notes 6 until the end of 2004, he said.

Spam Buster

IBM's Lotus Software Group said Notes and Domino 6.5 will be available soon. Among the new features is a "block mail from sender" option that allows users to train their Notes client to stop spam that gets through corporate network controls.

Pricing starts at $89 per user for the basic Notes 6.5 e-mail client and $1,145 per processor for Domino Messaging Server 6.5. For more full-featured e-mail and collaboration versions, pricing begins at $125 per user and $2,964 per processor for Domino Enterprise Server 6.5.

Also available is a standalone Web-based version called Domino Utility Server 6.5, which starts at $15,067 per processor and lets companies write collaborative applications for Domino that can be accessed through Web browsers without separate client software. **41676**

New in Notes

In addition to tight integration of e-mail and instant messaging, Notes 6.5 includes:

- **A follow-up folder** to hold mail to be answered
- **Flags for e-mails** that have been replied to or forwarded
- **A "block mail from sender"** option to help eliminate spam
- **Easily viewable lists** of online co-workers for IM

California Passes Spam Ban

BY STEPHEN LAWSON

California took a tough stand against spam last week, as Gov. Gray Davis signed a law prohibiting anyone from sending unsolicited commercial e-mail to California e-mail addresses.

E-MAIL

The law sets up an opt-in requirement intended to prevent users from getting e-mail advertisements unless they've asked to be on the sender's list. Senders of unsolicited messages could be held liable for damages up to $1,000 for each message to an individual and up to $1 million for each e-mail advertisement sent out. The recipient, the state attorney general or the e-mail service provider could seek damages.

The law also bans the sending of spam from California and prohibits the collection of e-mail addresses or registering multiple e-mail addresses for the purpose of sending spam. The law is set to take effect Jan. 1.

Unscrupulous spammers who are hard to track down are unlikely to knuckle under, but the law should have some effect on both senders and recipients of commercial e-mail, legal experts said.

"I don't think this is the silver bullet to spam. You're still going to want e-mail filters, and you're still going to receive spam from parts unknown, but this will make a dent," said David Kramer, a partner at law firm Wilson, Sonsini, Goodrich and Rosati in Palo Alto, Calif.

Companies that may have been on the fence about whether to send unsolicited commercial e-mail now have a clear sign that it's illegal and that the potential for lawsuits will enter the cost equation, he said.

A strong law in the U.S. state with the highest population will also apply pressure for more effective national laws, Kramer added. Now, for members of Congress, "it's hard to go on record supporting weak or preemptive legislation," he said.

> **"It's not appropriate for one state, by writing an overly broad law, to dictate what people do elsewhere."**
>
> **CINDY COHN**, LEGAL DIRECTOR, ELECTRONIC FRONTIER FOUNDATION

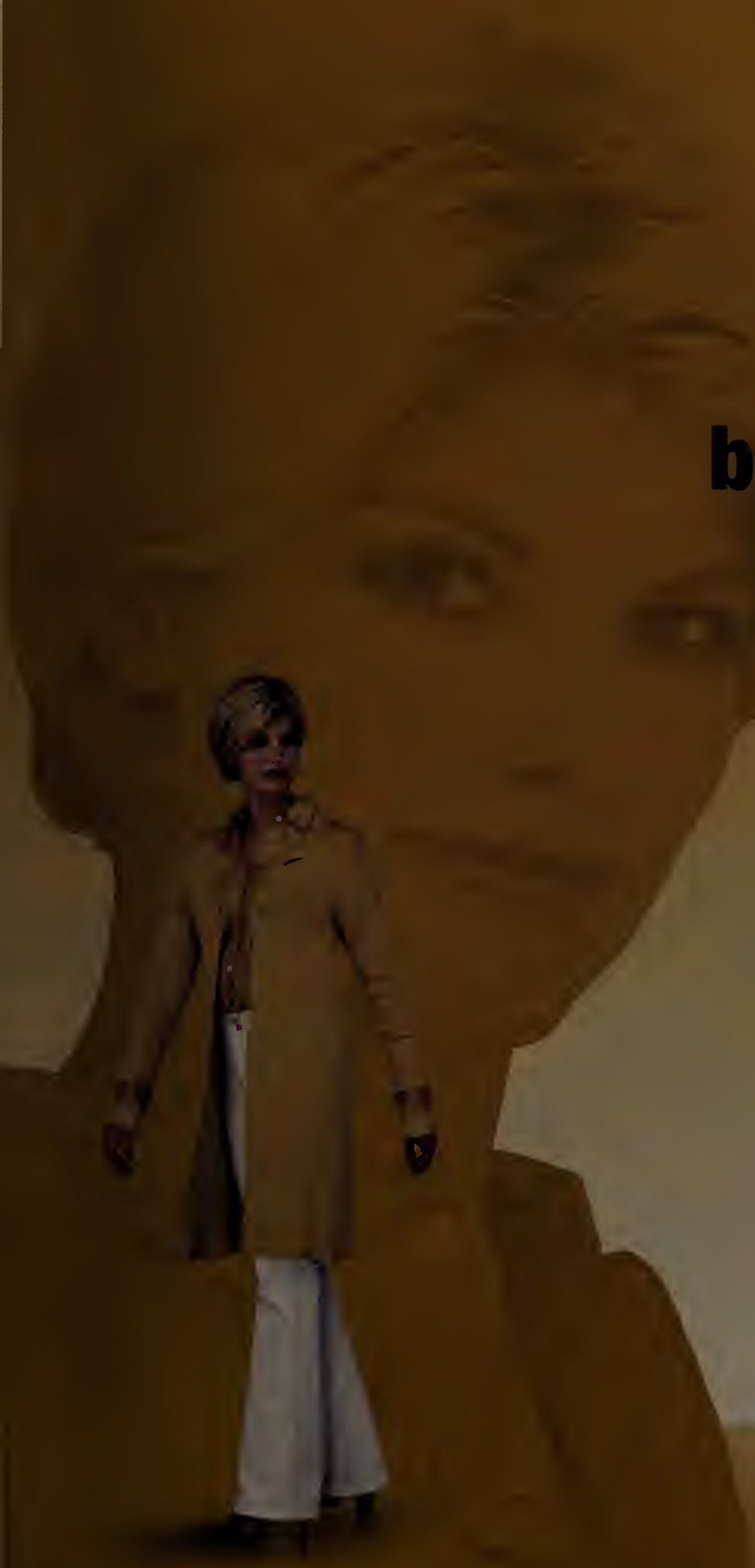
Washington is indeed where the battle is headed, said Devin Gensch, an attorney at Fenwick & West LLP in Mountain View, Calif.

"I don't think this is the end of it," Gensch said. The law is likely to spark action by both spam opponents that want stronger laws and industry groups that want to preempt California with a more permissive federal law, he said.

Cindy Cohn, legal director of the Electronic Frontier Foundation, a San Francisco-based Internet rights group, said she's worried about the impact of the law.

"It's not appropriate for one state, by writing an overly broad law, to dictate what people do elsewhere," she said. The best way to fight spam is not with a law but with filtering technology, which is more flexible, Cohn said. **41678**

Lawson writes for the IDG News Service.



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UPS Invests $30M in IT to Speed Package Delivery

Automated system will plan loading of trucks, driver routes

BY BOB BREWIN
LOUISVILLE, KY.

UNITED Parcel Service Inc. last week said it's starting to roll out a $30 million package-flow system that was designed to help the company more efficiently plan deliveries made by its 70,000 drivers in the U.S.

Cathy Callagee, the package carrier's vice president of information services, said at the UPS Technology Summit here that the package-flow project is aimed at speeding up deliveries and enabling drivers to make more stops on their routes. Callagee declined to comment about the return on investment that's expected from the software.

But UPS CIO Ken Lacy said the more efficient routing made possible by the system should reduce the mileage of the company's delivery fleet by more than 100 million miles per year, saving about 14 million gallons of fuel. UPS has piloted the software at its Roswell, Ga., delivery center and plans to deploy it at all U.S. hubs by 2005, Lacy said.

Smart Technology

UPS is basing the package-flow system on so-called smart labels that contain bar-coded delivery information and are already used by more than 90% of its customers, Callagee said. Customers upload the information used to create the labels to a secure page on UPS's Web site before drivers pick up packages, and the data is then transmitted to the company's delivery centers. When the system is operational, the data will be used by UPS to produce a dispatch plan for each delivery route.

UPS's package-flow system will replace some manual processes.

Callagee added that the system will also generate preloading labels for packages to aid in the loading of delivery vans. In addition, it will also include built-in geographic information system software to help planners map out routes. The software is being written in a combination of C and C++ and will run on UPS's existing back-end systems, with end users accessing it via PCs.

Although UPS currently uses bar code scanners to help sort packages in its delivery hubs, planning routes is a manual process that relies on complicated paper charts. Jack Levis, director of industrial engineering at UPS, said the new system will store routing data electronically and provide workers with automated truck-loading instructions.

Callagee said that by capturing shipment information ahead of time, delivery planners could adjust the loads and routes of drivers to optimize delivery efficiency. For example, if a driver has to make an extra-large delivery, some of the work on his route could be diverted to others.

'Touchless' System

Jackie Wood, a UPS systems engineer, said the software will also provide drivers with a delivery manifest for the first time. Until now, drivers determined their daily routes by checking the way packages were loaded in the delivery van, a process that required them to "touch the cardboard," Wood said. With the new system, route information will be electronically transmitted to the handheld devices used by drivers via Wi-Fi wireless LANs installed at UPS's delivery centers, she noted.

Lacy claimed that the technology will provide UPS with "a distinct competitive advantage." But Traci Barnett, a spokeswoman for Memphis-based FedEx Corp., said the UPS rival already uses similar systems to capture and transmit customer delivery information to its hubs. FedEx also has route planning and mapping software in place, although it doesn't load delivery manifests on its driver terminals, Barnett said. **41695**

UPS Sees RFID In Its Future but Isn't Ready to Deploy Devices

LOUISVILLE, KY.

UPS currently uses bar code scanning systems to track the 13 million packages it delivers on an average day. But CEO Mike Eskew last week said he views the adoption of radio frequency identification (RFID) technology by the company as being close to inevitable.

However, Eskew didn't put a time frame on when UPS will embrace RFID tags, which proponents say can store more detailed information about items that are being tracked than conventional bar codes can.

In July, UPS officials said the company was evaluating whether RFID technology could help make its supply chain management service more efficient [QuickLink 40170]. But at last week's technology summit, Eskew wouldn't commit to any specific plans. Usage of the technology by UPS "will happen when it can be embedded in the ink that creates [shipping] labels," he said.

Eskew noted, though, that Wal-Mart Stores Inc.'s plan to require its top 100 suppliers to start using passive RFID tags on shipping pallets by 2005 could take the technology to the stage where it "reaches a critical mass" of users. Bentonville, Ark.-based Wal-Mart announced its embrace of RFID devices in June.

Eric Morley, director of supply chain operations at Best Buy Co. in Richfield, Minn., said at the UPS conference that the electronics retailer plans to launch an RFID test project in the second quarter of next year.

Morley added that although Wal-Mart wants to drive the price of RFID tags down to five cents each, the higher-margin electronic items Best Buy sells could support a per-device cost of 50 cents.

– Bob Brewin

Network Configuration Tool Upgrade Targets Sarbanes-Oxley Compliance

BY MATT HAMBLEN

Gold Wire Technology Inc. today plans to announce a software upgrade for its Formulator line of network configuration management appliances, adding features that it said can help users meet the requirements of the Sarbanes-Oxley Act and other regulations.

Waltham, Mass.-based Gold Wire also said the new release will be able to track configurations of Unix servers in addition to its existing support for network devices made by vendors such as Cisco Systems Inc. and Nortel Networks Ltd. The upgrade is available now; pricing for Gold Wire's Formulator 200 systems starts at $22,000, plus a per-user license fee of $275.

REGULATIONS
For more on Sarbanes-Oxley compliance issues, go online:
QuickLink a3250
www.computerworld.com

Jim Sherer, director of ASP operations at ADP Inc.'s Dealer Services unit in Hoffman Estates, Ill., said he plans to test the new Formulator release within the next month. The company, which provides computing services to 6,500 auto dealers in the U.S., has been using Gold Wire's current version since February to track changes to systems that are maintained by 1,700 technical support workers.

The new regulatory compliance component is "extremely important" to ADP Dealer Services as it seeks to run required security audits on its systems, Sherer said. Gold Wire's technology should help the ADP unit track end users and check whether they have proper authentication, he said.

In addition to the regulatory features, the upgrade gives users increased reporting capabilities, Sherer said.

Gold Wire is part of an emerging group of network configuration management vendors that also includes Voyence Inc., AlterPoint Inc. and Rendition Networks Inc., said Glenn O'Donnell, an analyst at Meta Group Inc.

"They're all trying to demonstrate a way to do configuration better, since it's a horribly manual state of affairs right now with lots of errors and inconsistencies," O'Donnell said. He added that Nortel's Optivity technology and Cisco's CiscoWorks software can manage configurations for their respective devices but not for a diverse network. **41697**

MORE THIS ISSUE
Despite IT spending limits, UPS and others aren't giving up on innovation. **Page 41**

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Continued from page 1

Architecture

vice-oriented path in its mission to deliver Web applications that it hopes will make it easier for the county's citizens to interact with their government. Developers are being asked to provide speedier delivery of those applications, which draw information from legacy systems, she said.

The service-oriented development approach holds great promise in that regard, since programmers shouldn't need to start from scratch. A developer can expose a legacy application through standards-based interfaces and create a software component or service to represent a piece of functionality that can be accessed programmatically. Files that describe the services and how to connect to them can be stored in a registry.

Developers can turn to the registry to see which services are available and use tools to ease the process of linking to them. The ultimate goal is to be able to assemble loosely coupled applications, rather than writing lots of code for tightly coupled applications.

One of the presumptions in the service-oriented approach is code reuse. But IT shops that have been trying for years to achieve that goal are aware of the uphill battle they face. "To get the mind-set change to go out and look for existing code runs contrary to the traditional approach, which is to do it yourself," said one application developer at a financial firm, who asked not to be identified.

"We have good developers who look for those opportunities, but others simply do what they have to do to get by," said Chuck Howard, a Waco, Texas-based development services manager at Southern Farm Bureau Casualty Insurance Co. "Unless you [give] people [an incentive] to do it, they're not going to do it."

Gartner analyst Michael Blechar said one approach is to reward programmers in the form of bonuses during annual performance reviews. But the more effective tack for some clients has been punishment for not reusing code, he said.

Another incentive program to encourage developers to write reusable code is a chargeback system, Blechar said. The business unit that funds and creates the code can be credited when another unit reuses it.

One large banking institution logged more than $2 million per year in chargebacks from business units reusing its components, according to Blechar. In return, those groups received tested and proven code that required zero development time.

But before considering an elaborate incentive system, many companies are merely trying to get the IT and business sides of the house to both back a service-oriented architecture. Although many companies have been experimenting with Web services, few have mandated a service-oriented approach for the majority of their development work.

"If it's going to be the priority, it has to come from the top down," said Howard, noting that his company has taken a service-oriented approach only in isolated cases to date.

> **If [a service-oriented approach] is going to be the priority, it has to come from the top down.**
>
> **CHUCK HOWARD,** DEVELOPMENT SERVICES MANAGER, SOUTHERN FARM BUREAU CASUALTY INSURANCE CO.

Vida Wong, an IT director at Farmers Insurance Group in Simi Valley, Calif., said one challenge will be finding a business sponsor who understands the value of the service-oriented approach and identifying services such as payment document imaging. Farmers is in the process of laying the foundation for a service-oriented architecture.

Chuck Kellum, an Indianapolis-based senior technology analyst at Mid-States Corporate Federal Credit Union, said his company started an initiative to overhaul its entire application infrastructure with the hope of gaining greater flexibility, reliability and scalability. With a service-oriented architecture, the IT department will be able to redesign how it supports the business processes and enable change in the processes themselves, he said.

"The challenge is working with the business owners to identify what's going to remain the same and what's going to change," Kellum said.

Wyette Spotts, manager of application services at Universal Underwriters Group in Overland Park, Kan., said his company hasn't had an overarching development strategy and the switch to a service-oriented architecture will represent a culture shift.

Spotts said he and some of his colleagues have been cautious about change because their systems have been working reliably. But Spotts said he can see how the company would benefit from eliminating redundant processes and being able to quickly introduce new products as the business dictates. **41692**

Service-Oriented Approach

Companies face a series of nontechnology challenges as they implement a service-oriented development architecture. Gartner analyst Michael Blechar recommends that organizations do the following:

- Have developers skilled in component and service design.
- Make organizational changes to the development group to reflect shared components and services.
- Implement governance policies to identify components and services that can be shared and to account for changes that may be made to the services.
- Develop a program to promote code reuse, including an incentive system.

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Merrill Lynch Talks Up Web Services

LOS ANGELES

Programming experience in Java or C# aren't the only job skills that might be helpful for an IT manager plotting a service-oriented development strategy.

IT executives at New York-based Merrill Lynch & Co., an early adopter of Web services, have found that communications skills are especially important to spread the word about the Web services they're hoping their colleagues will put to good reuse.

"What it really comes down to is marketing," said Jim Crew, director of strategic infrastructure and distributed services (IDS). "You have to be an effective marketer because you've got to get your message out."

Code reuse is one of the key benefits that a company can gain by adopting a service-oriented architecture, and Crew said his group has seen significant reuse, even though it doesn't have a formal strategy for publicizing its work.

The firm's asset management group, for instance, learned of the work that Crew's IDS department had done using a homegrown X4ML tool to expose CICS applications through Web services interfaces during a "lunch-and-learn" session, which the company routinely holds on a wide range of topics, including non-IT issues.

The asset management IT group subsequently invited its IDS colleagues to do a presentation about their Web services and intranet-based X4ML directory. The group later found services that it decided to use to gain access to more up-to-date data.

Merrill Lynch IT groups also have held technology boot camps, workshops, expositions and demonstrations and have e-mailed newsletters to keep their IT colleagues abreast of their Web services work.

Another key factor in the success of a service-oriented development effort is the commitment of the CIO or chief technology officer as well as having key sponsors on the business side, said Gafar Lawal, director of the data and technology architecture group at Merrill Lynch.

Even though the initial champion of Merrill Lynch's Web services efforts, CTO John McKinley, left the company earlier this year, the effort hasn't lost any steam, according to the firm's IT executives. John Cummings, the new chief information and services officer, picked up the torch and continues to support the service-oriented approach, they said. "John leaving didn't really change much for us, because everybody had already [committed] at the higher level that this is the right direction to go," Lawal said.

Lawal himself has been instrumental in driving one of Merrill Lynch's most ambitious Web services projects, a wealth management system the company is co-developing with The Thompson Corp. Thompson, which is responsible for the Web front end, gains access to Merrill's back-end systems through a Web services framework.

To further the cause, Lawal said he compelled about 80 colleagues to participate virtually in an integration framework specification group that focuses on technology for the wealth management system.

– Carol Sliwa

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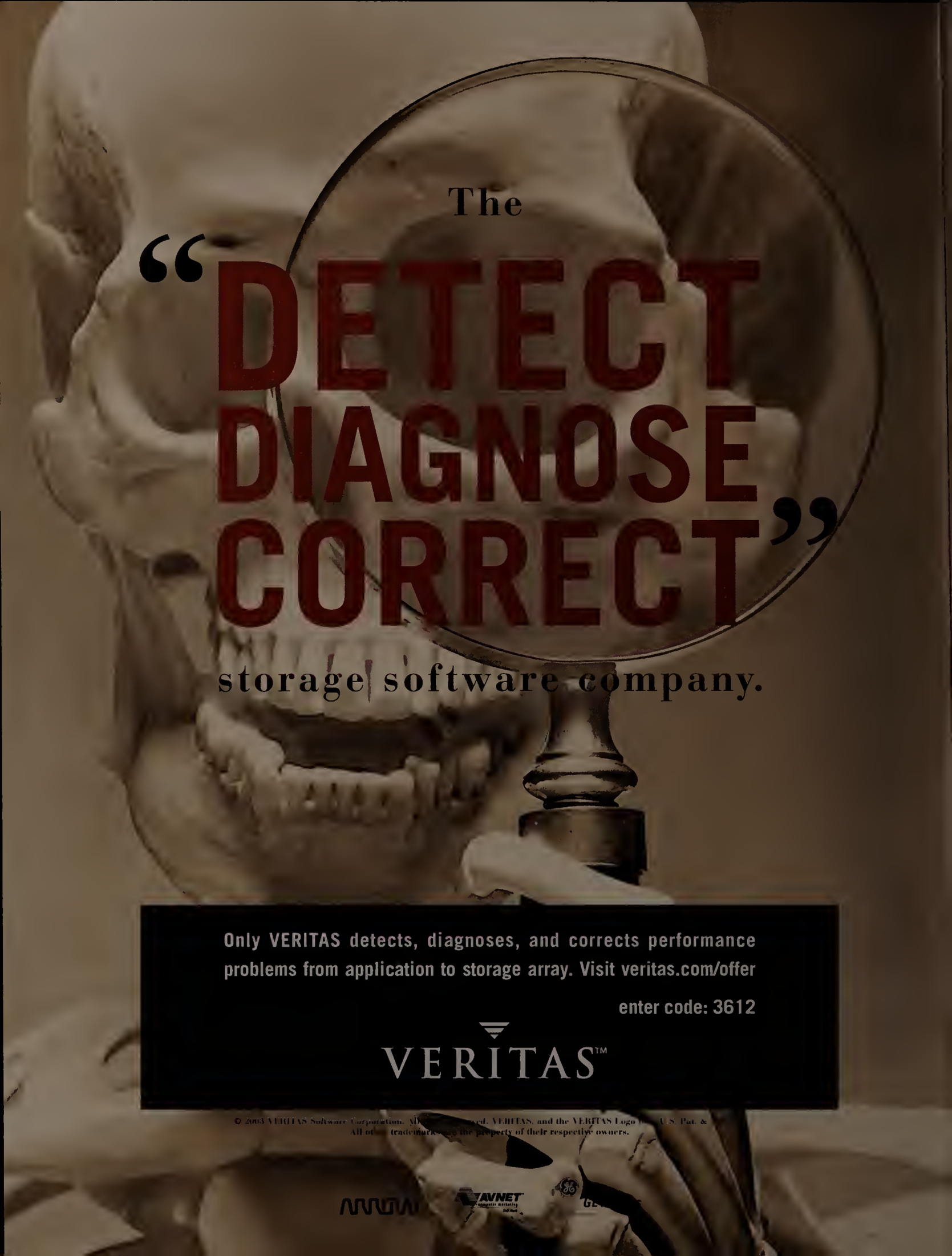
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AVNET

SNIA
Storage Networking Industry Association

Sheila Childs

Chairman
Board of Directors
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Industry Association

The Storage Networking Industry Association (SNIA) remains dedicated to promoting the use of highly evolved, widely accepted storage networking systems across the IT community – systems that meet the demands of today's organizations and can cope with the projected requirements of future applications. This fourth annual Storage Networking Industry Directory & Buyer's Guide is intended to be the industry's most comprehensive listing of participants in both North America and Europe.

The SNIA's relationship with Computerworld provides the latest information on storage networking and advanced storage technologies to IT users and vendors. Our collective vision is to remain the leading source of information, education and guidance for the industry by promoting the evolution and acceptance of industry standards among vendors, implementers and users. We endeavor to accomplish this by producing the highest quality industry conferences with our Storage Networking World® conference series in the United States, Europe and Asia.

This Storage Networking Industry Directory & Buyer's Guide, which includes member companies of SNIA, SNIA-Europe (recently unified with FCIA-Europe) as well as other leading Storage Industry participants, is yet another important component of our integrated industry information offering. We invite you to explore and consider the expertise, resources and storage solutions provided by the companies listed and profiled in this publication in both the North American and European sections.

Regards,
Sheila Childs and Paul Talbut

SNIA EUROPE

Paul Talbut

Chairman
Storage Networking
Industry Association
Europe

IDC
Analyze the Future

The storage industry remains poised to provide strategic opportunities and technology advancements for the IT departments of worldwide organizations. IDC continues to project increased demand for networked storage solutions as the benefits of enhanced data management, data security and data availability are realized.

With both global applications and regional deployments, the greatest challenge remains the need to identify proven components of integrated solutions as well as quality vendors, service providers and implementers. Users should insist that their storage-technology suppliers meet interoperability, scalability and reliability expectations.

This unique, annual Storage Networking Industry Directory & Buyer's Guide provides storage-solution seekers with a list of North American and European suppliers and industry experts. IDC is proud to be a leader in analyzing and educating the storage market. We are pleased to again partner with both the SNIA and Computerworld as a sponsor of this valuable resource.

Regards,

John T. McArthur
Group Vice President
IDC

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Company listings were compiled from an industry survey conducted by Computerworld's Strategic Programs & Events unit together with association member companies supplied by the SNIA U.S. and European chapters. The information presented in these profiles, including the designation of the Storage Products and Services marketed by them (see below) and their contacts, was provided directly by the companies themselves. Computerworld, the SNIA and IDC are not responsible for the accuracy of the information provided.

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Storage Products and Services Legend

DM = Data Management
OSM = Online Storage Management
S = Services
SD/S= Storage Devices/Subsystems
SNI= Storage Network Infrastructure
SRM= Storage Resource Management

Associations

(SNIA) = SNIA Member
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Wayne, PA 19087
800-555-6845
www.21stcenturysoftware.com

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4209 Technology Dr.
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800-392-7300
www.3ware.com

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3ware Inc., the technology leader in high-capacity Serial ATA RAID storage solutions, delivers reliable, enterprise-class RAID storage. The company's StorSwitch™ architecture eliminates the bottlenecks found in traditional storage. 3ware solutions meet the explosive demand for cost-effective, scalable storage driven by high-capacity applications. 3ware sells through VARS, OEMs and System Integrators. *(SD/S)*

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4Knowledge specializes in the development and delivery of customized lecture and labs focused on current and emerging storage network technologies (FC/FCIP/iSCSI). Solution set expertise includes CISCO, Brocade, McData, VERITAS, EMC, IBM, HP, CA, HDS, SUN and others. Get your customized class/boot camp today! *(S)*

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www.actona.com

John Henze, Vice President, Marketing
jhenze@actana.com, 408-399-8612
Baruch Deutsch, Vice President, Products
baruch@actana.com, 408-399-8616
Steven Velardi, Vice President, N.A. Sales
svelardi@actana.com, 408-399-8603

Actona Technologies is the partner of choice enabling storage consolidation across the WAN. The company's solutions drive storage, management and backup out of remote offices and into the data center. The end result is that distributed enterprises can better protect and cost-effectively manage their remote office data. *(SD/S,DM,S)*

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Milpitas, CA 95035
408-945-8600
www.adaptec.com

Glenn Clawney, Directar, Marketing
glenn_clawney@adaptec.cam, 408-957-5680
Tim Cannelly, Directar, Marketing
tim_cannelly@adaptec.cam, 321-207-1212
Tam Flageallet, Vice President, Sales
thamas_flageallet@adaptec.cam, 408-957-7215

Adaptec is a leading provider of end-to-end storage solutions – from ASICs and add-in cards to external storage systems and networking solutions. The company's product portfolio includes iSCSI, Fibre Channel, SATA, TCP/IP Offload, SCSI and RAID cards, and iSCSI, Fibre Channel and SCSI external storage subsystems. *(SD/S,SNI)*

ADIC
P.O. Box 97057
Redmond, WA 98073
800-336-1233
www.adic.com

Kevin Haneycutt, Vice President, Global Partners
Janathan Otis, Seniar Vice President, Technalagy
Scatt Raza, Executive Vice President, Sales

ADIC is a leading provider of Intelligent Storage™ solutions and the world's largest supplier of open system tape libraries. ADIC data management software provides IT managers innovative tools for managing their digital assets. ADIC products are available through a global network of resellers and OEMs, including Cray, Dell, Fujitsu-Siemens, Hewlett-Packard, IBM and Sun. *(SD/S,DM)*

ADTX (Advanced Technology and Systems Co., Ltd.)
YBP E. Tower 9F, 134 Gohdo-cho Hodogaya-ku
Yokohama-city, Kanagawa, Japan 240-0005
81 45 334 2291
www.adtx.com

Tashihide Nagai, Directar, International Pre-sales
nagai@adtx.com
Kunia Iwata, Vice President, Chief Technalagy Officer
iwatak@adtx.com
Naresh K.Chadha, President, U.S. & Europe Operations
naresh@adtx.com, 386 1 5865 359

ADTX is a Japan-based storage manufacturer offering RAID subsystems. ArrayMasStor-L series is the world's first shipped SATA-based RAID subsystem, which has features such as huge capacity, low cost, high performance and duplex capability. Along with unique optional features such as remote mirroring and instant copy, ArrayMasStor-L can be an ideal near line storage.

Advanced Systems Group (ASG)
12405 N. Grant St.
Thornton, CO 80241
800-894-3619
www.virtual.com

Agilent Technologies
397 Page Mill Rd.
P.O. Box 10395
Palo Alto, CA 94303
650-752-5000
www.agilent.com

Jean Dassanville, Product Manager, SAN Tester
Jean_dassanville@agilent.cam, 719-590-5679
Jerry Wang, Engineer, Storage Campanents Applicatians
Jerry_wang@agilent.cam, 408-553-3126
Jun Chie, Manager, Business Development
Jun_chie@agilent.cam, 719-590-3318

Agilent is a leading provider of component and test solutions for storage networking. Its expertise stretches from the equipment design stage to network installation and operation. With the Agilent 1730 Series SAN test system, you can quickly and easily characterize the performance of your complex storage networking equipment. For more information on components, visit www.agilent.com/view/storage

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Ottawa, Ontario Canada K2L 2N2
888-909-4500
www.akara.com

Elaine Bird
ebird@akara.com, 613-270-9505
Matthew Williams, Seniar Product Engineer
mwilliams@akara.com, 888-909-4500
Jack Reeves, Vice President, Sales & Marketing
jreeves@akara.com, 888-909-4500

Akara provides enterprises with the lowest cost, highest performance storage extension solution for connecting business continuance applications between geographically dispersed data centers. Akara multiplexes data center protocols (FC FICON, ESCON, GbE). *(SD/S,SNI,DM,S)*

Alacritech Inc. *(SNIA)*
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San Jose, CA 95112
408-487-5720
www.alacritech.com

Alacritus Software
3825 Hopyard Rd., Suite 275
Pleasanton, CA 94588
925-469-0725
www.alacritus.com

Paul JJ Payack, Seniar Vice President, Marketing
pjjp@alacritus.com, 925-469-0725
Don Trimmer, Chief Strategic Officer
dtrimmer@alacritus.com, 925-469-0725
Bob Jackson, Vice President, New Business Development
bjacksan@alacritus.com, 925-469-0725

Alacritus Software is the storage industry's innovator of disk-based data protection software solutions. Alacritus' first product, Securitus, a virtual tape library, delivers all the benefits of disk, while preserving the customer's current library infrastructure. The principals of Alacritus continue in the tradition responsible for many key storage industry technological breakthroughs. *(SD/S,SNI,DM)*

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612-436-8200
www.alebra.com

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6145-F Northbelt Pkwy.
Norcross, GA 30071
800-828-9264
www.ami.com

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800-774-0235
www.amerivault.com

AppIQ Inc.
200 Wheeler Rd., 3rd Floor
Burlington, MA 01803
781-425-6260
www.appiq.com

Tom Rose, Vice President, Marketing
tam.rose@appiq.com, 781-425-6270
Ash Ashutosh, Chief Technology Officer & Founder
ash@appiq.com, 781-425-6282
Roger Cummings, Vice President, Sales
roger.cummings@appiq.com, 630-308-4200

The AppIQ Solution Suite is the first standards-based family of SAN and storage resource management solutions that seamlessly integrates physical and logical storage resource discovery, provisioning, reporting, automation, chargeback, asset management and performance analysis with the management of business-critical applications such as Oracle and Microsoft Exchange. *(SRM,S)*

Aristos Logic Corporation
27051 Towne Centre Dr., Suite 290
Foothill Ranch, CA 92610
949-380-3400
www.aristoslogic.com

Adam Zagorski, Director, Marketing
a.zagorski@aristoslogic.com, 949-380-3447
Marc Acosta, Director, Technical Marketing
m.acosta@aristoslogic.com, 949-380-3426
Joe Calgate, Vice President, Sales
j.colgate@aristoslogic.com, 949-380-3435

Aristos Logic creates dedicated RAID Storage Processors that bring new levels of performance, features and cost-effectiveness to enterprise storage controllers for networked storage. The company's processors offer unbeatable price-performance for entry-level products and scalability for mid-range products. Along with Aristos software, they provide basic RAID functionality that vendors use as a foundation for value-added features. *(SRM)*

Arkay Storage Solutions Inc.
291 Cleveland-Massillon Rd.
Akron, OH 44333
330-665-9111
www.arkayinc.com

Arkeia Corporation
5650 El Camino Real, Suite 155
Carlsbad, CA 92008
760-431-1319
www.arkeia.com

Frederic Renard, Director, Marketing
marketing@arkeia.com
Arnaud Spicht, Chief Technology Officer
aspicht@arkeia.com
Philippe Lavieille, Director, Sales
sales@arkeia.com

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Arsenal Digital Solutions
8000 Regency Pkwy., Suite 110
Cary, NC 27511
919-466-6700
www.arsenaldigital.com

Steve Siegel, Director, Marketing
ssiegel@arsenaldigital.com, 919-466-6707
Randy Whitehead, Chief Operating Officer
rwhitehead@arsenaldigital.com, 919-466-6700
Kevin Tooley, Vice President, Sales
ktooley@arsenaldigital.com, 919-466-6700

Arsenal is the industry's fastest growing Storage Management Services provider. With its fully managed IDC-based and remote storage services for data protection and business continuity, the company has built a reputation as the most trusted source for outsourced storage management services. *(DM,SRM,DSM,S)*

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908-221-2000
www.business.att.com

Kassi Kesner, Director, AT&T Managed Storage Services
kesner@att.com, 973-644-6515
John Sovas, Product Manager
jsavas@att.com, 908-658-0546
Aid Galijatovic, Product Manager
agalijatovic@att.com, 732-420-3419

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Atempo Inc.
1887 Landings Dr.
Mountain View, CA 94043
650-428-2000
www.atempo.com

Laurent Fanichet, Director, Marketing Communications
laurent.fanichet@atempo.com, 650-428-2000
Paul Linares, Director
paul.linares@atempo.com, 650-428-2005

Founded in 1992, Atempo delivers best-in-class storage software and services for the information protection and security of data-intensive companies. *(SRM)*

ATTO Technology Inc.
155 CrossPoint Pkwy.
Amherst, NY 14068
716-691-1999
www.attotech.com

Sherri Robinson, Director, Markets Management
srobinson@attotech.com
Ed Tierney, Director, Product Management
etierney@attotech.com
Steve Lloyd, Vice President, Sales
slloyd@attotech.com

ATTO Technology Inc., Amherst, NY, is a global leader in storage and storage-infrastructure solutions for direct-, network- and fabric-attached environments. The company's lines of Fibre Channel and SCSI host adapters, Fibre Channel bridges and hubs, iSCSI bridges, SAN software, and RAID storage arrays improve data availability, productivity and total cost-of-ownership. *(SD/S,SNI,DM,S)*

Availant
200 Fifth Ave., 6th Floor
Waltham, MA 02451
781-890-9955
www.availant.com

Terry Glunz, Director, Education Services
services@availant.com, 781-890-9955
Jim Wentworth, Principal Storage Architect
services@availant.com, 781-890-9955
Amber Conley, Director, Business Development
services@availant.com, 781-890-9955

Availant is a provider of professional and engineering services. The company's offerings include SAN and storage assessment, planning, design and implementation; data migration; availability assessment; HACMP cluster planning, design and implementation; validation testing; course development and delivery in AIX, clustering and storage; and development services across UNIX and Windows. *(SNI,DM,SRM,S)*

Avamar

1A Technology Dr.
Irvine, CA 92618
949-743-5100
www.avamar.com

Jonoe Lee, Vice President, Business Development
jlee@ovomor.com, 949-743-5100
Chris Stonton, Vice President, Soles
cstanton@ovamar.com, 949-743-5100

Avamar Axion™ is a family of highly efficient, disk-based appliances for data backup, restore and disaster recovery. Axion systems reduce the scale of secondary storage by more than tenfold. Axion achieves this effective compression by eliminating redundant data across files and machines using a process called commonality factoring. *(SD/S,DM,S)*

Avnet Enterprise Solutions

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Tempe, AZ 85284
800-442-8638
www.es.avnet.com

Michael Nitka, Consultant, Storage Technology
michael.nitka@avnet.com, 310-787-4103
Mike Schmidt, Director, Server & Storage Solutions
mike.schmidt@avnet.com, 310-787-4110

Avnet Enterprise Solutions, with 25 years of experience, is a solutions integrator specializing in enterprise storage solutions including data protection and recovery and networked storage. As HP's Storage Partner of the Year, the company offers professional assess and design services and a hands-on SAN Center to ensure a "best practices" solution. *(SD/S,SNI,DM,SRM,OSM,S)*

BakBone Software

10145 Pacific Heights Blvd., Suite 500
San Diego, CA 92121
858-450-9009
www.bakbone.com

Peter Eck, Vice President, Marketing
peter.eck@bakbone.com, 858-450-9009
Charles Keiper, Product Manager, NetVault
charles.keiper@bakbone.com, 858-450-9009
Scott Petersen, Vice President, North America Sales
scott.petersen@bakbone.com, 858-450-9009

BakBone Software is a leading data recovery solution provider that develops and globally distributes data backup, restore and disaster recovery software for network storage environments. BakBone delivers scalable solutions that address the needs of large enterprise environments and small to medium-size businesses. *(SNI,DM,OSM,S)*

Baydel

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San Jose, CA 95131
408-383-7474
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BL Trading

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Hanover, MA 02339
781-982-9664
www.bltrading.com

BlueArc Corporation *(SNIA)*

225 Baypointe Pkwy.
San Jose, CA 95134
408-576-6600
www.bluearc.com

Broadcom Corporation *(SNIA)*

16215 Alton Pkwy.
Irvine, CA 92619
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Brocade Communications Systems Inc.

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Brocade® (Nasdaq: BRCD) offers the industry's leading intelligent platform for networking storage. Using the Brocade SilkWorm® family of fabric switches and software, customers can connect servers with storage devices through a Storage Area Network (SAN) to optimize data availability and storage and server resources. *(SNI)*

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781-272-8200
www.bustech.com

Candera Inc. *(SNIA)*

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Milpitas, CA 95035
408-228-6500
www.candera.com

Chaparral Network Storage

7420 E. Dry Creek Pkwy.
Longmont, CO 80503
303-845-3200
www.chaparralnet.com

CIENA Corporation

1201 Winterson Rd.
Linthicum, MD 21090
410-694-5700
www.ciena.com

Stephen Barr, Director, Applications Marketing, Storage
sborr@cieno.com, 770-886-6279
Patrick Simands, Senior Product Line Manager
psimands@cieno.com, 678-482-2218
Jason Phipps, Director, Partnerships & Enterprise Sales
jophipps@cieno.com, 678-482-2218

CIENA delivers innovative network solutions to carriers and enterprises worldwide, increasing the cost-efficiency of current services while enabling the creation of new carrier-class data services. CIENA solutions are interoperable with leading storage technologies and provide the manageability, density and flexibility to enable cost-effective, high-bandwidth connectivity for extended storage applications. *(SNI)*

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763-551-4000
www.ciprico.com

Cisco Systems Inc.

170 W. Tasman Dr.
San Jose, CA 95134
800-553-NETS
www.cisco.com/go/storagenetworking

Soni Jiandoni, Vice President, Marketing
sjiandon@cisco.com, 408-526-5640
Ed Chapman, Director, Marketing
echapman@cisco.com, 408-526-5630
Frank Palumbo, Director, Operations - Storage Networking
fpalumbo@cisco.com, 212-714-4360

Cisco Systems offers a comprehensive portfolio of storage networking products including directors, fabric switches, IP storage routers and metro-optical networking solutions. Whether you require cost-effective storage networking solutions for the enterprise, department/workgroup and small/medium-size business or high-performance business continuance implementations in the MAN or WAN, Cisco meets your requirements with intelligent, highly available solutions. *(SNI,SRM,OSM,S)*

Cloverleaf Communications

2 Willow St.
Southborough, MA 01745
508-624-9500
www.cloverleafcomm.com

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vbecker@cloverleafcomm.com, 508-624-9500

Cloverleaf Communications' Intelligent Storage Networking System consolidates heterogeneous storage devices and centralizes the provisioning and management of capacity, bandwidth and superior, multi-protocol, data center services. Cloverleaf's system dramatically improves scalability, performance, business continuance and security yielding exceptional value, flexibility and productivity in enterprise-class IT environments. *(SNI)*

CMS Peripherals Inc.

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Costa Mesa, CA 92626
800-327-5773
www.cmsproducts.com

CNT

6000 Nathan Ln. N.
Minneapolis, MN 55442
763-268-6000
www.cnt.com

Gail Greener, Vice President, Marketing
gail_greener@cnt.com
Mark Knittel, Group Vice President, Product Operations
mark_knittel@cnt.com
Jim Fanello, Executive Vice President, Worldwide Sales & Services
jim_fanello@cnt.com

CNT (www.cnt.com) is a global expert in cost-effective and reliable storage networking solutions. Businesses depend on CNT to improve their business efficiency and business continuity through increased data availability. CNT helps companies build end-to-end solutions through analysis and design, multi-vendor integration, implementation and ongoing remote management of the storage infrastructure. *(SD/S,SNI,S)*

CommVault Systems Inc.

2 Crescent Pl.
Oceanport, NJ 07757
732-870-4000
www.commvault.com

CommVault QiNetix is value-based data management that directly links the value of data to the cost of managing it by associating the location, protection, recovery, retention and preservation of data to its underlying infrastructure. The QiNetix suite includes award-winning Galaxy Backup & Recovery, QiNetix DataMigrator, QiNetix Quick Recovery and QNet. *(DM)*

Computer Associates

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Islandia, NY 11749
877-246-3674
www.ca.com/brightstor

Gory McGuire, Senior Vice President
gory.mcguire@co.com, 508-628-8000
Dovid Luft, Vice President, Development Storoge
david.luft@co.com, 631-342-6000
Mark Milford, Areo Monoger
mork.milford@co.com, 703-708-3000

BrightStor solutions give companies the power to manage enterprise storage from a single location. BrightStor helps ensure the availability and integrity of your most valuable asset – data. CA's solutions maximize IT and storage resources, integrating with hardware and software and scalable for any sized business. *(SNI,DM,SRM,S)*

CreekPath Systems

7420 E. Dry Creek Pkwy., Suite 100
Longmont, CO 80503
303-845-1000
www.creekpath.com

Scott Honsbury, Vice President, Marketing & Business Development
scott.honsbury@creekpoth.com, 602-325-9211
Mike Koclones, Chief Technology Officer & Co-Founder
mkoclones@creekpoth.com, 303-845-1010
Jason Howe, Vice President, Soles
jhowe@creekpoth.com, 303-845-1026

CreekPath's Storage Operations Management software suite is an end-to-end storage management solution that simplifies, stabilizes and secures the storage management process by enabling people to visualize and control their storage operations. The CreekPath Suite introduces an application level, policy-based management system and workflow-based automation to deliver comprehensive management control. *(SRM)*

Crossroads Systems *(SNIA)*

8300 N. MoPac Expy.
Austin, TX 78759
800-643-7148
www.crossroads.com

DataCore Software Corporation

6300 N.W. 5th Way
Fort Lauderdale, FL 33309
954-377-6000
www.datacore.com

Ken Harner, Vice President, Morketing
infa@datacare.com, 954-377-6000
Ziyo Aral, Chief Technology Officer
info@datacore.com, 954-377-6000
Corlos Correras, Vice President, Americos Soles/Worldwide Business Development
info@dotocore.com, 954-377-6000

DataCore Software is an independent software vendor that consolidates and automates storage management for open systems. The company's SANsymphony™ software pools, caches and replicates storage from all the major array suppliers. Global 2000 enterprises use DataCore's innovative technology to centralize storage management. DataCore, headquartered in Fort Lauderdale, FL, is privately held. *(SD/S,SNI,SRM,OSM,S)*

Datalink

8170 Upland Cir.
Chanhassen, MN 55317
952-944-3462
www.datalink.com

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275 Shoreline Dr., Suite 450
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Dell Inc.

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Dell offers a comprehensive portfolio of hardware, software and services designed to protect your vital information…simply, powerfully and affordably. Dell is committed to offering the best storage value in the industry and features the Dell/EMC and Dell PowerVault product lines for NAS, SAN, DAS and tape backup products. *(SD/S,SNI,DM,SRM,OSM,S)*

Dimension Data

11600 Sunrise Valley Dr.
Reston, VA 20191
703-262-3200
www.us.didata.com

Geory Campbell, Vice President, Solutions Morketing
geary.compbell@us.didoto.com, 703-262-6134
Juon Hernandez, Soles Monoger, North Americo
juon.hernandez@us.didoto.com, 305-383-9572

Reduce your IT infrastructure operating costs over 20% with a storage solution from Dimension Data, a global technology company providing networking, application integration and managed services solutions. Dimension Data's extensive storage expertise ranges from assessments to consolidation to "Storage Ready Networks," which it defines as a single intelligent infrastructure to provide data/voice/video and storage services. *(SD/S,SNI,DM,SRM,OSM,S)*

DLTtape™

4001 Discovery Dr.
Boulder, CO 80303
720-406-5700
www.DLTtape.com

Todd Clork, Monoger, Chonnel Morketing
todd.clork@quontum.com, 508-929-3726

DLTtape products offer users the flexibility to implement a single technology family across their enterprise, from the entry-level series DLT VS80 to the new enterprise-series SDLT 600 drive. With an installed base of nearly 2.5 million DLTtape drives in use today and more than 100 million DLTtape media cartridges shipped, DLTtape Technology is a standard for backup and archiving of business-critical data.

Dot Hill Systems Corporation

6305 El Camino Real
Carlsbad, CA 92009
800-872-2783
www.dothill.com

Omor Borroza, Directar, Morketing & Product Management
omor.barraza@dathill.com, 760-931-5545
Dono Kommersgard, Chief Technology Officer
dono.kommersgord@dathill.com, 760-431-4430
Jim Lombert, Chief Executive Officer
jim.lombert@dothill.com, 760-431-4485

Dot Hill Systems Corporation is a leader in the innovative design and delivery of storage networking solutions to channel partners worldwide. Its products include the SANnet® II family of storage systems, which are NEBS Level 3 and MIL-STD-810F certified, SANscape® storage management software, SANpath® storage networking software and professional training, support and service. *(SD/S,SNI,DM,SRM,OSM)*

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866-796-6369
www.emc.com

EMC Corporation is the world leader in information storage systems, software, networks and services, and the only company 100% dedicated to automated networked storage. *(SD/S,SNI,DM,SRM,OSM,S)*

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Wilmington, MA 01887
978-661-4800
www.empirix.com

Gordon Eddy, Monoger, Strotegic Morketing
geddy@empirix.com, 978-661-1288
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mgeonokokis@empirix.com, 978-661-4840

Empirix delivers test solutions that verify the performance and reliability of communications equipment, networks and applications. The industry-leading PacketSphere Storage Test Platform creates varying network conditions to measure performance and reliability of IP storage devices, networks and applications at full wire rate over Gigabit Ethernet. *(SNI)*

Emulex Corporation
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Costa Mesa, CA 92626
800-854-7112
www.emulex.com

Rase Mesnard, Inside Sales
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Emulex, named one of Forbes Magazine's 2S Fastest Growing Technology Companies, is the world's largest supplier and developer of storage networking HBAs. Emulex product families are based on internally developed ASIC, firmware and software technologies for Fibre Channel and IP networking protocols, offering high performance, scalability, flexibility and reduced TCO. *(SNI,SRM)*

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Eurologic Systems *(SNIA)*
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Boxborough, MA 01719
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Exabyte Corporation
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Boulder, CO 80301
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972-980-7098
www.excelmeridiandata.com

Paul Kleifgen, Vice President, Marketing & Sales
prk@excelmeridiandata.cam, 972-980-7098
Eric Brown, Manager, Research & Development, Productian
ericb@excelmeridiandata.cam, 972-980-7098

Excel Meridian Data produces a family of NAS Filers, CD/DVD Servers and RAID sub-systems for all computer networks. *(SD/S)*

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www.falconstor.com

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www.fastora.com

Finisar Corporation *(SNIA)*
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Sunnyvale, CA 94089
408-S48-1000
www.finisar.com

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San Clemente, CA 92673
888-3S3-0337
www.popnetserver.com

Fujitsu Computer Products of America
2904 Orchard Pkwy.
San Jose, CA 9S134
408-432-6333
www.fcpa.fujitsu.com

Shareen Harvey, Senior Analyst, Marketing
sharvey@fcpa.fujitsu.com, 408-894-3926

Fujitsu Computer Products of America Inc. (FCPA) conducts engineering and marketing activities in San Jose, CA, and sales operations throughout the United States. FCPA's current product and service offerings include hard disk drives, magneto-optical drives, scanners and scanner maintenance. For more information, call 800-626-4686 or 408-432-6333 or visit: http://www.fcpa.fujitsu.com *(SD/S)*

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Parag N Saraiya, Manager, Marketing-Storage
psaraiya@npd.hcltech.com, 91 984 107 9983
Vasan V Srini, Manager, Storage Practice
vasan@npd.hcltech.com, 408-482-1203
Sandeep Kalra, Account Manager
skkalra@hcltech.com, 408-482-1203

Storage vendors gain cost and time advantages through HCLT's product development, sustaining, testing and interoperability testing (lab consisting of 200 equipment) services and reusable components (iSCSI Stack, iSCSI-FCP Gateway). HCLT works with storage vendors on FC, SCSI and iSCSI products, and SNIA in SMI and IMA test suites. *(SD/S,SNI,DM,SRM,S)*

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www.hp.com

Brad Harwell
brad.harwell@hp.cam, 281-927-1642
Jim Odasz
jim.adasz@hp.cam, 281-514-1588
Marilyn Edling
marilyn.edling@hp.cam, 916-785-3693

HP StorageWorks delivers products, solutions and services enabling an Adaptive Enterprise allowing businesses to reduce costs and minimize risk. From networked storage, including SAN and NAS technology, to direct attached storage (DAS), HP StorageWorks is uniquely capable of delivering the complete IT infrastructure with HP OpenView software and world-class services. *(SD/S,SNI,DM,SRM,DSM,S)*

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Los Gatos, CA 9S032
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Hitachi Data Systems
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Santa Clara, CA 9S008
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Hitachi Data Systems is committed to enabling organizations worldwide to exploit the full potential of information. By following and deploying its TrueNorth™ strategy, Hitachi Data Systems provides customers with a broad range of offerings, including enterprise and modular storage systems, software and professional services to simplify, protect and optimize their information infrastructures. *(SD/S,SNI,DM,SRM,DSM,S)*

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Honeywell Sensing and Control is one of the world's leading suppliers of sensing and switching solutions for storage equipment manufacturers. Our technologies are used in system-critical applications to measure or monitor position, speed, temperature, humidity, force, presence/absence and distance. OEMs rely on Honeywell for the right solution for their application.

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IBM develops and manufactures the industry's most advanced information technologies, including computer systems, software, networking systems, storage devices and microelectronics. IBM offers customers worldwide the most comprehensive range of storage products available today. These storage solutions are offered through IBM and a large network of IBM Business Partners. For more information, visit www.ibm.com/totalstorage or www.tivoli.com/storage.

ICP Electronics Inc.
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Shi-Chi City, Taipei Hsien, Taiwan 221
886 2 2690 2098
www.ieiworld.com

Amanda Wu, Senior Specialist, Marketing
amandawu@iei.com.tw
Johnson Yang, IA Product Manager
johnsonyang@iei.com.tw, 886 2 2690 2098
Roy Chuang, Head of IA Sales Department
roychuang@iei.com.tw

IEI designs and manufactures arguably the widest selection of Network Attached Storage (NAS) products. Heading more into the enterprise-level market, solutions such as NAS-4120 and NAS-4300 offer high performance and advanced features with multiple TB capacities and one of the industry's lowest TCOs, making them ideal enterprise storage solutions. OEM/ODM welcome. (SD/S,SNI)

InfiniCon Systems Inc. *(SNIA)*
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www.infiniconsys.com

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700 Monte Vista Ln.
Half Moon Bay, CA 94019
6S0-712-670S
www.infinityio.com

Elaine Silber, Director, Training & Certification
elaine@infinityio.com, 859-341-5004
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ross@infinityio.com, 650-965-8739

Infinity I/O combines multi-vendor solution expertise and unmatched industry experience to offer IT professionals the most comprehensive Storage Networking education available today. The company's premier training and certification solutions ensure that its customers gain the market understanding and technical expertise necessary to optimize the development and deployment of multi-vendor storage networks. *(S)*

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Santa Clara, CA 9S0S4
408-988-S088
www.infortrend.com

Thomas Bayens, Director, Marketing
thomas@infortrend.com, 408-988-5088
Jorge Del Carpio, Director, Technical Support
jorge@infortrend.com, 408-988-5088
Tony Chu, Vice President, Sales & Marketing
tony@infortrend.com, 408-988-5088

Focused on RAID storage technology since its founding in 1992, Infortrend designs, manufactures and markets cross-platform, enterprise performance RAID storage controllers and subsystems based on its own RAID firmware and custom ASIC design. Its EonStor subsystems feature intelligent drive management, redundant controllers, and support Fibre, SCSI, ATA and SATA interfaces. *(SD/S)*

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90S-763-4967
www.infostream.ca

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Info X is the premiere worldwide distributor of EMC-approved and vendor-certified Fibre Channel Host Bus Adapters, Switches, Routers and Cable Assemblies. Storage OEMs and Integrators rely on the company's expert sales team and superior technical knowledge. Its key partners are industry leaders and include: EMC, QLogic, Emulex, JNI, Crossroads, Cambex, Finisar and Emerson Network Power.

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973-890-7300
www.innovationdp.fdr.com

Thomas J. Meehan, Vice President
tmeehan@fdrinnovation.com, 973-890-7300
Chris Warren, European Manager
cwarren@fdrinnovation.com, 44 0208 905 1266

Innovation Data Processing, enterprise business data protection leader with the FDR Family of Storage Management products including FDR/UPSTREAM for Open Systems, and zLinux, IAM for VSAM application acceleration. FDRINSTANT extends data replication technology of storage vendors such as FlashCopy with non-disruptive protection. FDRPAS provides economical, non-disruptive disk and volume relocation making new hardware installation a snap. *(DM,SRM,DSM)*

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Intel supplies a wide range of interoperable design components for storage solutions, and designers can select from multiple levels of engineering integration. Intel is helping to shape technology through industry-standard specification development. This standards-based approach fosters a community of providers who accelerate the availability of interoperable, networked storage solutions that result in lower total costs of storage development and ownership. Come by and see what Intel Storage Anywhere can mean to you.

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San Jose, CA 9S134
408-678-8600
www.intransa.com

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Los Altos, CA 94022
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www.inviosoftware.com

Iomega Corporation
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San Diego, CA 92130
8S8-314-7000
www.iomega.com

Wayne Arvidson, Director, Marketing
arvidson@iomega.com, 858-314-7024
Akshay Gupta, Product General Manager
guptaak@iomega.com, 858-314-7048
Tim Moriarty, Director, Sales
moriarty@iomega.com, 925-964-9142

Iomega NAS servers are perfect for small to medium businesses and corporate workgroups as they combine maximum choice, ease of integration and industry-leading fault tolerance at breakthrough prices. In addition, Iomega offers the fully tested NAS Backup Solution that provides complete backup, recovery, archive and data protection solutions. *(SD/S,SNI,DM)*

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Santa Clara, CA 9S0S4
408-330-4S00
www.iready.com

Isilon Systems
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Seattle, WA 98119
206-31S-7S00
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Irvine, CA 92618
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www.istor-networks.com

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10300 Valley View Rd.
Eden Prairie, MN 55344
952-941-5905
www.i-tech.com

Tom Brown, President
tom_brown@i-tech.com, 952-941-5905
Tom Robinson, Product Monoger
tom_robinson@i-tech.com, 952-828-0159
Jim Johnson, Director, Soles
sales@i-tech.com, 952-828-0101

I-TECH is a world leader in test solutions for critical storage and network applications and recently introduced the PowerFrame™ Storage Test System, a scalable test solution for monitoring SANs and storage components. This versatile test system accommodates modules supporting a wide range of protocols and transfer speeds. PowerFrame's modularity is ideal for multiple users. *(SD/S,SNI)*

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www.ixiacom.com

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Chatsworth, CA 91311
818-993-4801
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10945 Vista Sorrento Pkwy.
San Diego, CA 92121
858-523-7000
www.jni.com

jobstor.com

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Jobstor.com is a leading employment website dedicated to serving the needs of the data storage industry. Built around jobstor.com's core of an industry-specific job board is a plethora of resources and tools for the everyday storage professional. *(S)*

JVC

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Wayne, NJ 07470
800-526-5308
www.jvc.com/pro

Robert Horris, Vice President, Marketing
rharris@jvc.com, 973-317-5000
Amy Miyo, Monager, Engineering
omiya@jvc.com, 714-816-6500
Douglas Arnold, Manager, National Sales
darnold@jvc.com, 973-317-5224

JVC manufactures the MC-8000 series DVD libraries in capacities of 470GB to 5.6TB. JVC's premier partner, Trident Tek, offers the first HSM Appliance for NAS connectivity of DVD libraries. The Appliance offers connectivity via dual 10/100 NICs and can also support optional Gigabit or Fibre Channel. For more information: www.tridenttek.com *(SD/S,DM,SRM)*

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905-238-6900
www.kastenchase.com

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www.knowledgetransfer.net

Brad Hughey, Manager, Morketing
bhughey@knowledgetronsfer.net, 847-507-0744
LeRoy Budnik, Chief Executive Officer
lbudnik@knowledgetronsfer.net, 630-668-0471
Jeff James, Manager, Nationol Soles
jjomes@knowledgetronsfer.net, 630-677-8250

Knowledge Transfer builds business-savvy storage and operations teams. The company is an IT architecture and management consulting firm. Using vendor neutral or specific approaches, it develops ITIL-based storage services, accounting for human factors. Leading storage vendors and their customers depend on the company for solutions and training. Knowledge Transfer empowers you. *(SD/S,SNI,DM,SRM,OSM,S)*

KOM NETWORKS

SNIA

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613-599-7205
www.komnetworks.com

Glenn Kohut, Vice President, Corporate
glennk@komnetworks.com, 613-599-7205
Kamel Shaath, Chief Technology Officer
kamels@komnetworks.com, 613-599-7205
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Issaquah, WA 98027
425-369-9842
www.lapis-solutions.com

LeftHand NETWORKS

LeftHand Networks
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Boulder, CO 80301
866-4-IPSANS
www.lefthandnetworks.com

Tom Major, Vice President, Marketing
tom.major@lefthandnetworks.com, 303-217-9081
John Spiers, Chief Technology Officer
john.spiers@lefthandnetworks.com, 303-217-9088
David Bangs, Vice President, Soles
david.bangs@lefthondnetworks.com, 303-217-9080

LeftHand Networks re-defined shared network storage in 2002 with the introduction of the first full-featured IP storage area network (SAN). By building a SAN utilizing the existing Ethernet infrastructure, the LeftHand Networks solution eliminates the learning curve, expensive Fibre Channel components and complexity associated with Fibre Channel SANs. *(SD/S)*

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www.legato.com

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www.lightsand.com

LiveVault Corporation
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Marlborough, MA 01752
508-460-6670
www.livevault.com

LSI Logic Corporation *(SNIA)*
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Milpitas, CA 95035
866-574-5741
www.lsil.com

Lucent Technologies

SNIA

Lucent Technologies
600 Mountain Ave.
Murray Hill, NJ 07974
888-458-2368
www.lucent.com

Susan Friedman, Director, INS Marketing
spfriedmon@lucent.com, 732-949-0309
Jacob Larsen, Director, Portfolio Management & Business Development
jlarsen@lucent.com, 732-949-1563
Jim Greaney, Director, Storage Networking Sales
greoney@lucent.com, 508-415-5944

Lucent Technologies designs and delivers networks for the world's largest communications service providers and enterprises. Backed by Bell Labs research, Lucent Worldwide Services offers unmatched global capabilities for network professional services. Lucent enables end-to-end SAN extension solutions through a broad portfolio spanning FCIP, SONET/SDH, DWDM, security, network management and more. *(SNI,S)*

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972-444-2323
www.lxicorp.com

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3061-B Zanker Rd.
San Jose, CA 95134
408-834-4000
www.marantinetworks.com

Maxtor Corporation
500 McCarthy Blvd.
Milpitas, CA 95035
408-894-5000
www.maxtor.com

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1975 Concourse Dr.
San Jose, CA 95131
408-382-6500
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McDATA Corporation
380 Interlocken Crescent
Broomfield, CO 80021
720-558-8000
www.mcdata.com

Mike Gustafson, Senior Vice President, Worldwide Marketing
mike.gustofson@mcdata.com, 720-558-8000
Jean Becker, Vice President, Engineering
720-558-8000
Alain Andreali, Executive Vice President, Worldwide Soles & Services
720-558-8000

McDATA is the expert provider of multi-capable storage networking solutions™ – hardware, software and services – that enable partners and customers to network the world's business data™. The company's innovation and experience are behind the success of the most demanding technology companies and their customers. *(SNI,SRM,S)*

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Redmond, WA 98052
425-882-8080
www.microsoft.com/storage

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Molex is a global provider of electrical and fiber optic connectors, complete system solutions, heat sinks, membrane switches as well as application tooling for a wide variety of industries. *(SO/S)*

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Redwood City, CA 94065
650-595-3040
www.monosphere.com

Roger LeMoy, Director, Marketing
roger@monosphere.com, 650-595-3108
Avi Shilla, Chief Technology Officer
avi@manasphere.com, 650-595-3102
Tony Schehtman, Vice President, Sales
tony@manasphere.com, 650-595-3105

MonoSphere Storage Manager™ delivers to enterprise customers the ability to centrally visualize, utilize, protect and optimize storage efficiently and automatically across all open systems storage vendors and architectures. By giving enterprises maximum understanding and control over their storage, MonoSphere provides significant cost savings by directly eliminating unnecessary storage capital expenditure. *(SRM,OSM)*

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1500 McCandless Dr.
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www.neoscale.com

NetScout Systems Inc.
310 Littleton Rd.
Westford, MA 01886
978-624-4000
www.netscout.com

Kathy Vorse, Manager, Marketing Communications
varsek@netscout.com, 978-614-4157
Eileen Hoggerty, Senior Product Manager, Marketing
haggertye@netscout.com, 978-614-6074
Mary DeSalva, Director, Corporate Sales Development
desalvom@netscout.com, 978-614-4152

NetScout's nGenius® Performance Manager, combined with nGenius LAN, WAN and SAN probes, delivers a complete set of capabilities for managing the performance of critical enterprise networks and applications. For storage environments, the nGenius solution monitors protocols and traffic for NAS, Fibre Channel SANs, iSCSI and iFCP in order to optimize performance, troubleshoot interoperability and manage bandwidth demand. *(OSM)*

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495 E. Java Dr.
Sunnyvale, CA 94089
408-822-6000
www.netapp.com

Mark Sontora, Senior Vice President, Worldwide Marketing
408-822-6000
Steve Kleiman, Senior Vice President, Engineering & Chief Technology Officer
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Since its inception in 1992, Network Appliance has delivered technology, product and partner firsts that continue to drive "The evolution of storage™." The company's enterprise storage solutions offer customers seamless data management, simplified backup and recovery, and effortless remote office access to data at the lowest cost of ownership. *(SD/S,SNI,DM,SRM,OSM,S)*

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763-694-4300
www.netex.com

Robert MacIntyre, Vice President, Business Development
bob.macintyre@netex.com, 763-694-4302
Dove Reiland, Chief Technology Officer
dove.reiland@netex.com, 763-694-4303
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tom.marphis@netex.com, 404-240-0916

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905-863-0010
www.nortelnetworks.com

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Provo, UT 84606
801-961-7000
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760-683-2500
www.nstor.com

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Los Gatos, CA 95032
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4820 Overland Ave.
San Diego, CA 92123
800-729-8725
www.overlandstorage.com

Darin Richins, Vice President, Worldwide Marketing
drichins@overlandstarage.com, 800-729-8725
John Metze, Chief Technology Officer
jmatze@overlandstorage.com, 800-729-8725
Marrie Nelsan, Vice President, Americas Sales
mnelson@overlandstarage.com, 800-729-8725

Overland Storage Inc. (NASDAQ: OVRL) is a leading global supplier of innovative hardware and software storage solutions for computer networks. The company's reputation for delivering high-availability products, including its award-winning Neo Series™ tape libraries and storage resource management software solution, sets the standard for intelligent, automated storage and scalability. For more information, visit www.overlandstorage.com. *(SD/S,SRM,OSM,S)*

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PowerQuest Corporation
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Orem, UT 84059
801-437-8900
www.powerquest.com

Jackie Brinkerhaff, Manager, Product Marketing
jackie.brinkerhoff@powerquest.com, 801-437-8307
Steve Fairbanks, Vice President, Product Management
steve.fairbanks@powerquest.com, 801-437-8900
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mark.milfard@powerquest.com, 801-437-8900

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Jim Lee, Vice President, Product Marketing
info@princetonsoftech.com, 800-457-7060
David Kanaf, Vice President, Product Integration
info@princetonsoftech.com, 800-457-7060
David Sample, Executive Vice President, Worldwide Sales & Field Operations
info@princetonsoftech.com, 800-457-7060

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Andover, MA 01810
978-684-3000
www.provisionsoft.com

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Aliso Viejo, CA 92656
949-389-6000
www.qlogic.com

Frank Berry, Vice President, Corporate Marketing
frank.berry@qlogic.com, 949-389-6499
Rob Davis, Vice President, Advanced Technology
rob.davis@qlogic.com, 952-932-4027
Denis Maynard, Senior Vice President, Sales & Marketing
denis.maynard@qlogic.com, 949-389-6068

Over 45 million QLogic products have shipped inside servers, workstations, RAID subsystems, tape libraries, disk and tape drives. Powering solutions from the industry's leading storage network providers, QLogic's broad line of controller chips, host bus adapters, network switches and management software move data from storage devices through the network fabric to servers. *(SNI,SRM)*

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949-754-8000
www.quest.com

Quantum
P.O. Box 57100
Irvine, CA 92619
949-856-7800
www.quantum.com

Robert Pickell, Vice President, Marketing
rob.pickell@quantum.com, 949-856-7800
Michael Del Rassa, Chief Technology Officer
michael.delrossa@quantum.com, 949-856-7800
Adrian Jones, Vice President, Sales
adrian.jones@quantum.com, 949-856-7800

Quantum is a leader in automated tape libraries and disk-based enhanced backup solutions used to manage, store and transfer data. From the desktop to the data center, Quantum offers the reliable products and proactive services that give customers confidence in their data. Products include: L-Series, M-Series, P-Series and DX-Series. *(SD/S,SNI,OSM,S)*

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2740 Zanker Rd.
San Jose, CA 95134
408-382-5000
www.rainfinity.com

Lisa Swenson, Director, Marketing
lswenson@rainfinity.com, 408-382-4736
Rieko Sato, Director, Product Management
rsato@rainfinity.com, 408-382-5900
Charles Fansler, Director, Inside Sales
cfansler@rainfinity.com, 408-382-5000

RainStorage is an award-winning NAS management appliance that enables administrators to move data, including open files, between storage devices without any disruptions to applications or end-users. RainStorage supports multi-protocol environments, including CIFS and NFS, and provides for data mobility between storage devices reducing the cost of storage management and improving utilization. *(DM,SRM,OSM)*

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6320 San Ignacio Ave.
San Jose, CA 95119
408-284-6200
www.sanvalley.com

Jim Mariner, Executive Vice President
jim.mariner@sanvalley.com, 408-284-6229
Sanford Heltan, President
sandy.heltan@sanvalley.com, 408-284-6200

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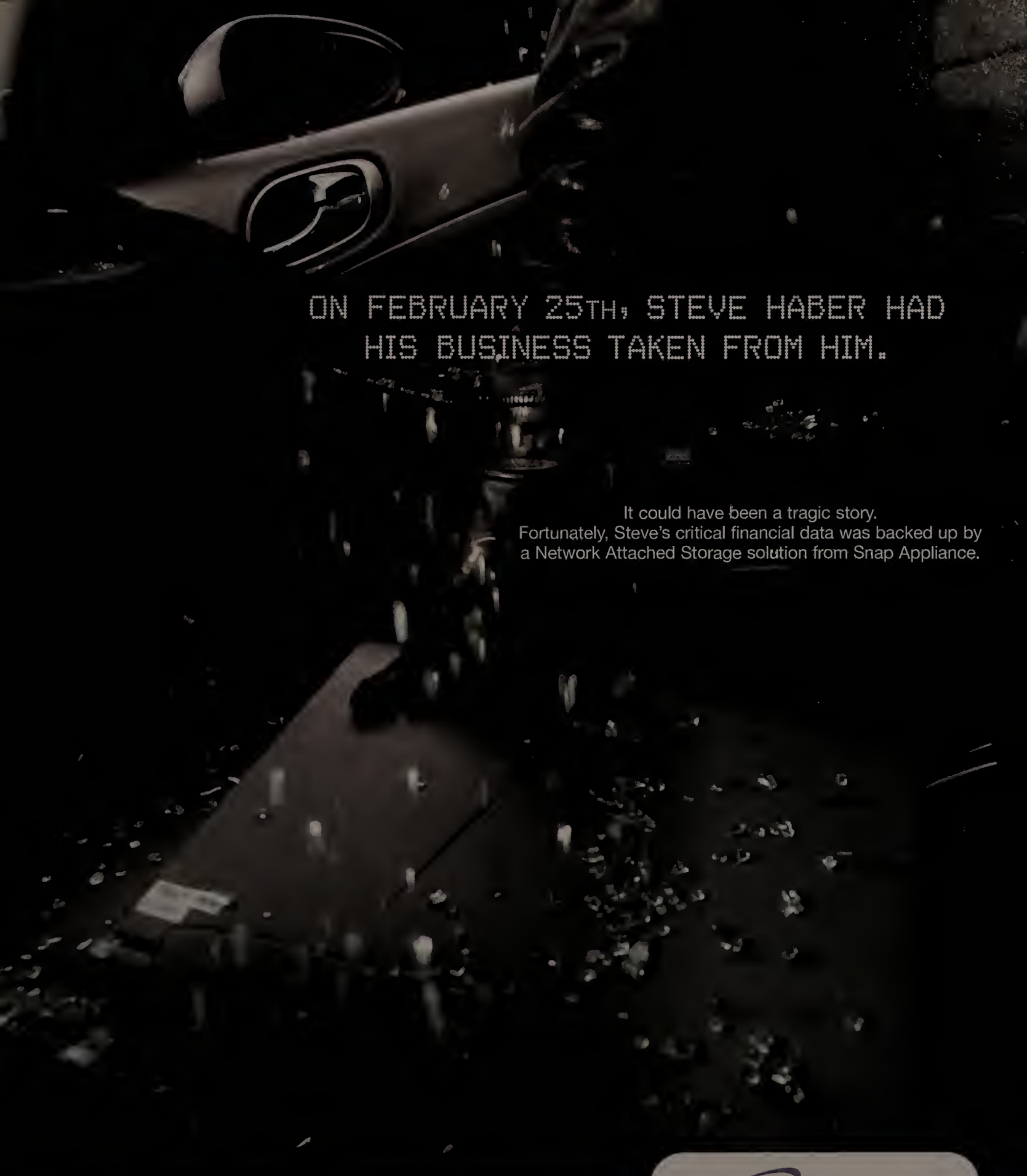

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603-766-2700
www.sandial.com

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soles@sandiol.com, 603-766-2892

Sandial is a pioneer in the development of connection-oriented storage network backbone solutions. Sandial's storage switching solutions, combined with a comprehensive management system and a full suite of professional service offerings, provide unprecedented levels of network visibility and control, enabling enterprises to better align corporate information assets with business goals. *(SN)*

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Alameda, CA 94502
510-521-2424
www.sanrad.com

Zophar Sante, Vice President, Market Development
zophar@sanrad.com, 510-521-2424
Gil Chaouat, Product Manager
gil@sanrad.com, 972 3 767 4806
David A. Stoner, Senior Director, North American Sales
dstoner@sanrad.com, 805-402-0859

SANRAD V-Switch 3000 is the industry's first iSCSI Storage Area Networking platform, capable of extending high-speed iSCSI connectivity to any FC/SCSI storage system with comprehensive network-based management services in an integrated network device, delivering multi-layer intelligent storage switching, high availability and security. *(SD/S,SN,DM,SRM,OSM,S)*

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408-376-1300
www.silverbacksystems.com

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2001 Logic Dr.
San Jose, CA 95124
408-879-8700
www.snapappliance.com

Jennifer Sparks, Director, Marketing
jsparks@snapappliance.com, 408-879-8700
Joe Disher, Director, Technical Marketing
jdisher@snapappliance.com, 408-879-8700
Jillion Mansolf Vice President, Worldwide Sales
jmansolf@snapappliance.com, 408-879-8700

Snap Appliance, a worldwide leader in storage management, provides simple, scalable network attached storage solutions for its customers – from the workgroup to the enterprise – solving their needs today with a seamless migration to the future. *(SD/S,SNI,DM,SRM,S)*

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1250 E. Arques Ave.
Sunnyvale, CA 94085
408-746-7638
www.softek.fujitsu.com

Chris Wagner, Vice President, Marketing
cwagner@softek.fujitsu.com
Karen Dutch, Vice President, Product Management
kdutch@softek.fujitsu.com
Erna Arnesen, Vice President, Worldwide Channels
earnesen@softek.fujitsu.com

Softek delivers award-winning automated storage resource management (SRM) solutions operating across more vendors and platforms than any other SRM software. Softek customers optimize and simplify the management of complex, multi-vendor storage infrastructures via action-based automated resource management to achieve better-utilized storage, more productive staffs and greater application availability. *(DM,SRM)*

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Colorado Springs, CO 80921
719-487-0760
www.solutioneering.us

Bob Wilson, Managing Partner & President
BWilson@solutioneering.us, 719-487-0760
Don Furkey, Partner
DFurkey@solutioneering.us, 408-395-0395
Jim Phelan, Partner
jfphelan@solutioneering.us, 603-483-8950

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Park Ridge, NJ 07656
800-829-7669
www.sony.com/datasystems

Aleta Moeller, Senior Marketing Specialist
aleta.moeller@am.sony.com, 800-829-7669
Tom Yuhas, Director
tom.yuhas@am.sony.com, 800-829-7669

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www.spinnakernetworks.com

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San Diego, CA 92121
858-678-2444
www.stonefly.com

Bob Preston Vice President, Marketing
bpreston@stonefly.com, 858-678-2435
Bill Huber, Chief Technology Officer
bhuber@stonefly.com, 858-678-2441
Tim Moen, Manager, National Sales
tmoen@stonefly.com, 858-678-2428

Storage Concentrators, IP-based storage provisioning appliances that enable mid-sized to large enterprises to manage and optimize their storage assets in real-time. *(SD/S,SN,DM,SRM,OSM)*

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508-229-1700
www.storability.com

Asim Zaheer, Vice President, Marketing
asim.zaheer@starability.com, 508-229-1700
Rick Ruskin, Vice President, Sales
rick.ruskin@starability.com, 508-229-1700

Storability's Global Storage Manager software centralizes the management of multi-site, multi-vendor storage infrastructures within enterprise companies at every level, from discovery through "just-in-time" provisioning. This innovative technology gives companies control over their heterogeneous storage environments, enabling them to increase asset utilization, maximize productivity and reduce cost of ownership. *(SRM)*

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310-302-7280
www.storactive.com

Storage Engine *(SNIA)*

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Tintan Falls, NJ 07724
732-747-6995
www.storageengine.com

StorageQuest Inc.

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Carp, Ontario Canada K0A 1L0
613-831-6919
www.StorageQuest.com

Marwan Zayed, Chief Executive Officer
MZayed@StorageQuest.com, 613-831-6919
John Jagelsky, Manager, U.S. Channel Development
jj@enhancementsales.com, 774-364-0702

The MSM 100 transforms an optical library into a network appliance. Attaching the library to the network through an MSM 100 provides secure and inexpensive archiving, and easy and quick access to archived files. To a user, media in the optical library looks like a network drive. *(SD/S,SNI,DM,SRM,S)*

StorageTek

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www.storagetek.com

StorageTek, a $2 billion worldwide company headquartered in Louisville, CO, delivers a broad range of storage solutions that are easy to manage, integrate well with existing infrastructures and allow universal access to data across servers, media types and networks. StorageTek provides practical and safe storage solutions in disk, networking, services, tape and tape automation. *(SD/S,SNI,DM,SRM,OSM,S)*

Storigen Systems Inc.

650 Suffolk St.
Lowell, MA 01854
978-323-4454
www.storigen.com

StorScape

625 Ellis St., Suite 201-B
Mountain View, CA 94043
650-968-2562
www.storscape.com

Bob Andersan, Business Development - Canada
908-542-8482
Garan Garevski, Chief Technology Officer
386 1 5865 356
Dusan Strakl, Business Development - USA
650-968-2562

StorScape integrates the concepts of SRM, data classification and data life cycle management for managing corporate data according to their business value. BSM for File Systems provides sophisticated data growth control, while BSM for Email is an integrated data life cycle management solution for MS Exchange environments. *(DM,SRM)*

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www.storserver.com

Sun Microsystems *(SNIA)*

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www.sun.com

Syncsort Inc.

50 Tice Blvd.
Woodcliff Lake, NJ 07446
201-930-8200
www.syncsort.com

Victor Werner, Marketing
vwerner@syncsort.com, 201-930-8259
Jae Stambauli, Software Services
mkuehn@syncsort.com, 201-930-8289
Michael Kuehn, Sales
mkuehn@syncsort.com, 201-930-8249

Backup Express is an enterprise-wide backup and restore solution that supports a variety of technologies, including NAS, NDMP, SANs, clusters and more. Its distributed architecture allows backups to any device in the network running UNIX, Linux, Windows or NetWare, while maintaining just one central catalog for the entire enterprise. *(DM,SRM)*

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www.tek-tools.com

TeraCloud Corporation

901 104th Ave. N.E.
Bellevue, WA 98004
425-709-2900
www.teracloud.com

Robert Bingham, Chief Marketing Officer
rbingham@tclaud.com, 425-709-2900
Brian Henling, Vice President, Engineering
bhenling@tclaud.com, 425-709-2900
Tom Phillips, Vice President, Sales
tphillips@tclaud.com, 425-709-2900

TeraCloud Corporation enables Fortune 1000 companies to manage distributed and mainframe storage and mission-critical data for DAS, SAN and NAS environments, down to file-level detail. TeraCloud's enterprise-wide software solution is hardware independent, integrating the management of UNIX, Windows, Linux, OS/390, NetApp and Netware from a single console. *(SRM)*

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www.texmemsys.com

The Mosaic Company

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Renton, WA 98035
425-254-1724
www.themosaiccompany.com

The Storage Group Inc.

603-C Garrison St.
Oceanside, CA 92054
760-435-9670
www.thestoragegroup.com

Robin Matherhead, Manager, Operations
robin@thestoragegroup.com, 760-435-9670
W.Curtis Preston, President & Chief Executive Officer
curtis@thestoragegroup.com, 760-435-9670
Elia R. Harris, Manager, Business Development
elia@thestoragegroup.com, 760-435-9670

The Storage Group is a unique company providing consulting services, including selecting, designing, implementing and maintaining storage systems, to end users, as well as analyst services, such as product concept evaluation, product development assistance and the creation of marketing materials, to vendors. *(S)*

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25 Dan Rd.
Canton, MA 02021
781-332-1000
www.tidalwire.com

Jeanne Friedman, Vice President, Marketing
jeonne.friedman@networkengines.com, 781-332-1114
Mike Riley, Vice President, Marketing & Strategy
mike.riley@networkengines.com, 781-332-1292
Bill Crowley, Vice President, Distribution Sales
bill.crowley@networkengines.com, 781-332-1119

TidalWire, a Network Engines company, specializes in the distribution and support of storage networking products. A leading distributor of HBAs in North America, TidalWire is also the exclusive distributor of Network Engines co-branded storage appliances for backup and management applications from FalconStor, Bocada, SANavigator and other top storage software vendors. *(SD/S,SNI,DM,SRM,OSM,S)*

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805-371-1377
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Unitrends Software Corporation
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Myrtle Beach, SC 29577
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www.unitrends.com

Venturcom Inc.
29 Sawyer Rd.
Waltham, MA 02453
781-647-3000
www.vci.com

Dennis Gullotti, Director, Strategic & Product Marketing
dgullotti@vci.com, 781-693-6227
Matt Cicciari, Senior Manager, Product Marketing
mcicciari@vci.com, 781-693-6219
Steve Woodard, Senior Vice President, Global Operations
swoodard@vci.com, 781-693-6245

Venturcom's BXP™ is a software-only solution that allows diskless Windows systems to boot and consolidate data to Storage Area Network (SAN) or Windows-powered Network Attached Storage (NAS) devices. BXP simplifies desktop image management and deployment reducing Total Cost of Ownership (TCO) of Windows-based network appliances and devices.

VERITAS Software
350 Ellis St.
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800-327-2232
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VERITAS Software is headquartered in Mountain View, CA, and employs 5,600+ people in 36 countries. With annualized revenues over $1.5 billion in 2002, VERITAS Software ranks among the top 10 software companies in the world. Through its award-winning and market-leading products on business efficiency and continuity, VERITAS Software provides the building blocks for Utility Computing.

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www.vicom.com

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301-668-0330
www.welocalize.com

Willem Stoeller, Vice President, Globalization
willem.stoeller@welocalize.com, 831-476-8480
Peter Betts, Manager, Business Development
peter.betts@welocalize.com, 800-370-9515

Welocalize provides globalization services to leading software companies in the storage and networking arena including Cisco Systems, Legato, Computer Associates, Kroll Ontrack and Yosemite Technologies. The company maintains offices in Frederick, MD, Portland, OR, and a European headquarters in Saarbrucken, Germany. Please visit www.welocalize.com for more information. *(S)*

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www.xilinx.com

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Eden Prairie, MN 55344
866-472-6764
www.xiotech.com

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949-476-1180
www.xiran.com

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Fresno, CA 93711
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www.tapeware.com

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6020 104th St.
Edmonton, Alberta Canada T6H 5S4
780-989-6800
www.yottayotta.com

Bort Shigemura, Chief Executive Officer
bshigemura@yottoyotta.com, 780-989-6800
Jack Kurtz, Vice President, Sales, Business Development & Customer Support
jkurtz@yottayotta.com, 703-684-4892

YottaYotta is the only infrastructure provider delivering utility enabling globally networked storage. The NetStorager System is a distributed solution delivering secure and continuous information access. YottaYotta's business solution is operated and managed as a single entity, maximizing resource utilization, improving operational cost while accelerating return on investment. *(SD/S,SNI,DM,SRM,OSM,S)*

Zago Technologies
14901 Don Julian Rd.
Industry, CA 91746
888-OPTIC-CD
www.zagotech.com

Joime, Chief Executive Officer
joimez@zogotech.com, 888-ZAGO-DVD
Heather L, Chief Technology Officer
heather@zogotech.com, 626-934-9222
Arlene, Vice President, Sales
arlene@zogotech.com, 877-DVD-RAM1

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www.zzyzx.com

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Sunnyvale, CA USA 9408S
001 800-392-7300
www.3ware.com

Barbara Murphy, Vice President, Marketing
001 408-523-1000
Jim Schmidt, Executive Vice President, Engineering & Chief Information Officer
001 408-523-1000
Mark Egerton, Vice President, Worldwide Sales
001 408-523-1000

3ware Inc., the technology leader in high-capacity Serial ATA RAID storage solutions, delivers reliable, enterprise-class RAID storage. The company's StorSwitch™ architecture eliminates the bottlenecks found in traditional storage. 3ware solutions meet the explosive demand for cost-effective, scalable storage, driven by high-capacity applications. 3ware sells through VARS, OEMs and System Integrators.

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www.4knowledge.net

Barry Jackson
barry@4knowledge.net, 001 720-344-1111

4Knowledge specializes in the development and delivery of customized lecture and labs focused on current and emerging storage network technologies (FC/FCIP/iSCSI). Solution set expertise includes CISCO, Brocade, McData, VERITAS, EMC, IBM, HP, CA, HDS, SUN and others. Get your customized class/boot camp today!

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www.adaptec-uk.com

Steve Owen, Product Manager
steve_owen@adaptec.com, 44 1276 854534
Russ Johnson, Vice President, Sales
russell_johnson@adaptec.com, 44 1276 854515

Adaptec is a leading provider of end-to-end storage solutions – from ASICs and add-in cards to external storage systems and networking solutions. The company's product portfolio includes iSCSI, Fibre Channel, SATA, TCP/IP Offload, SCSI and RAID cards, and iSCSI, Fibre Channel and SCSI external storage subsystems.

ADIC

P.O. Box 970S7
Redmond, WA USA 98073
001 800-336-1233
www.adic.com

Kevin Haneycutt, Vice President, Global Partners
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ADIC is a leading provider of Intelligent Storage™ solutions and the world's largest supplier of open system tape libraries. ADIC data management software provides IT managers innovative tools for managing their digital assets. ADIC products are available through a global network of resellers and OEMs, including Cray, Dell, Fujitsu-Siemens, Hewlett-Packard, IBM and Sun.

ADTX (Advanced Technology and Systems Co., Ltd.)

YBP E. Tower 9F, 134 Gohdo-cho Hodogaya-ku
Yokohama-city, Kanagawa, Japan 240-000S
81 4S 334 2291
www.adtx.com

Tashihide Nagai, Directar, International Pre-sales
nagai@adtx.com
Kunio Iwata, Vice President, Chief Technology Officer
iwatak@adtx.com
Naresh K.Chadha, President, U.S. and Europe Operations
naresh@adtx.com, 386 1 5865 359

ADTX is a Japan-based storage manufacturer offering RAID subsystems. ArrayMasStor-L series is the world's first shipped SATA-based RAID subsystem, which has features such as huge capacity, low cost, high performance and duplex capability. Along with unique optional features such as remote mirroring and instant copy, ArrayMasStor-L can be an ideal near line storage.

Alacritech Inc.

234 E. Gish Rd.
San Jose, CA USA 9S112
001 408-487-S720
www.alacritech.com

Alacritus Software

382S Hopyard Rd., Suite 27S
Pleasanton, CA USA 94S88
001 92S-469-072S
www.alacritus.com

Paul JJ Payack, Senior Vice President, Marketing
pjjp@alacritus.com, 001 925-469-0725
Don Trimmer, Chief Strategic Officer
dtrimmer@alacritus.com, 001 925-469-0725
Bob Jackson, Vice President, New Business Development
bjackson@alacritus.com, 001 925-469-0725

Alacritus Software is the storage industry's innovator of disk-based data protection software solutions. Alacritus' first product, Securitus, a virtual tape library, delivers all the benefits of disk, while preserving the customer's current library infrastructure. The principals of Alacritus continue in the tradition responsible for many key storage industry technological breakthroughs.

Alebra Technologies Inc.

100 Broadway Ridge
Minneapolis, MN USA SS413
001 612-436-8200
www.alebra.com

Amphenol

Kelburn Business Park
Port Glasgow, Scotland PA 14 GTD
44 7720 079 689
www.amphenol-aipc.com

AMS Technologies *(SNIA-E)*

Fraunhoferstr. 22
Martinsried/Munich, Germany 821S2
49 89 89S 77 0
www.ams.de

Antemeta *(SNIA-E)*

38, route nationale 10
Coignieres, France F78310
33 1 30 62 33 22
www.antemeta.fr

AppIQ Inc.

76 Bridge Ln., Bramhall, Stockport
Cheshire, United Kingdom SK7 3AW
44 0 161 28S 3299
www.appiq.com

Tom Rose, Vice President, Marketing
tom.rose@appiq.com, 001 781-425-6270
Ian Bowers, Senior Sales Engineer
ian.bowers@appiq.com, 44 0 7976 601 167
David Nortier, Vice President, EMEA
david.nartier@appiq.com, 44 0 161 285 3299

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41, rue Delizy
Pantin Cedex, France 93692
33 01 48 10 89 89
www.arkeia.com

Frederic Renard, Director, Marketing
marketing@arkeia.com
Arnaud Spicht, Chief Technology Officer
aspicht@arkeia.com
Philippe Lavieille, Director, Sales
sales@arkeia.com

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Les Boreales, 2, avenue de Laponie
Courtaboeuf Cedex, France 91951
33 1 64 86 83 00
www.atempo.com

Laurent Fonichet, Director, Marketing Communications
laurent.fonichet@otempo.com, 33 1 64 86 83 00
Lionel Teysseire, Chief Technology Officer
lionel.teysseire@otempo.com, 33 1 64 86 83 00
Fabrice de Soloberry, Vice President, Sales
fabrice.de.soloberry@otempo.com, 33 1 64 86 83 00

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155 CrossPoint Pkwy.
Amherst, NY USA 14068
001 716-691-1999
www.attotech.com

Sherri Robinson, Director, Markets Monogement
srobinson@ottotech.com
Ed Tierney, Director, Product Monogement
etierney@ottotech.com
Steve Lloyd, Vice President, Sales
slloyd@ottotech.com

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10145 Pacific Heights Blvd., Suite 500
San Diego, CA USA 92121
001 858-450-9009
www.bakbone.com

Peter Eck, Vice President, Marketing
peter.eck@bakbone.com, 001 858-450-9009
Charles Keiper, Product Monoger, NetVault
charles.keiper@bakbone.com, 001 858-450-9009
Scott Petersen, Vice President, North America Sales
scott.petersen@bakbone.com, 001 858-450-9009

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www.bltrading.com

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43 Worship St.
London, United Kingdom EC2A 2DX
44 207 012 5500
www.ciena.com

Stephen Borr, Director, Applications Marketing, Storage
sborr@ciena.com, 770-886-6273
Patrick Simonds, Senior Product Line Manager
psimonds@ciena.com, 678-867-3562
Stuart Poyne, Director, Enterprise & Business Partner Sales
spoyne@ciena.com

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170 W. Tasman Dr.
San Jose, CA USA 95134
001 800-553-NETS
www.cisco.com/go/storagenetworking

Sori Jiondoni, Vice President, Marketing
sjiandon@cisco.com, 001 408-526-5640
Ed Chapmon, Director, Marketing
echapmon@cisco.com, 001 408-526-5630
Frank Palumbo, Director, Operations - Storage Networking
fpalumbo@cisco.com, 001 212-714-4360

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Langley Slough, United Kingdom SL3 6EX
44 1753 792400
www.cnt.com

Robin Pilcher, Director, European Marketing
robin_pilcher@cnt.com
Mark Vorgo, Vice President, Sales
mark_vorgo@cnt.com

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001 877-246-3674
www.ca.com/brightstor

Gary McGuire, Senior Vice President
gary.mcguire@ca.com, 001 508-628-8000
David Luft, Vice President, Development Storage
david.luft@ca.com, 001 631-342-6000
Mark Milford, Area Manager
mark.milford@ca.com, 001 703-708-3000

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Edinburgh, Scotland EH3 6AA
011 44 31 220 8281
www.creekpath.com

Scott Hansbury, Vice President, Marketing & Business Development
scott.hansbury@creekpath.com, 001 602-325-9211
Mike Koclanes, Chief Technology Officer
mkoclanes@creekpath.com, 001 303-845-1000
Josan Howe, Vice President, Sales
jhowe@creekpath.com, 001 303-845-1000

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DataCore Software Corporation

200 Brook Dr., Green Park
Reading, United Kingdom RG2 6UB
44 0 118 949 7024
www.datacore.com

Bharat Kumar, Director, Marketing, EMEA
bharat.kumar@datacore.com, 44 0 118 949 7024
Chris Lentz, European Manager, Product Marketing
chris.lentz@datacore.com, 44 0 118 949 7024
Francis Glorie, Managing Director, European Operations
francis.glorie@datacore.com, 44 0 118 949 7024

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todd.clark@quantum.com, 001 508-929-3726

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0031 53 4284980
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Omar Barraza, Director, Marketing & Product Management
omar.barraza@dothill.com, 001 760-931-5545
Dana Kammersgard, Chief Technology Officer
dana.kammersgard@dothill.com, 001 760-431-4430
Bert H.M. van der Woning, Vice President, Sales, EMEA
bv@dothill.com, 0031 53 4284980

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www.excelmeridiandata.com

Paul Kleifgen, Vice President, Marketing & Sales
prk@excelmeridiandata.com, 001 972-980-7098
Eric Brown, Manager, Research & Development, Production
ericb@excelmeridiandata.com, 001 972-980-7098

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41 22 780 8111
www.hp.com

Rudi Schmickl
rudi.schmickl@hp.com, 49 7031 145 8060
Patrick Bonelli
patrick.banelli@hp.com, 49 7031 145 8121
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Shi-Chi City, Taipei Hsien, Taiwan 221
886 2 2690 2098
www.ieiworld.com

Amanda Wu, Senior Specialist, Marketing
amandowu@iei.com.tw
Johnsan Yang, IA Product Manager
johnsanyang@iei.com.tw, 886 2 2690 2098
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roychuang@iei.com.tw

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Hartley Wintney, United Kingdom RG27 8AS
44 845 603 4110
www.infinityio.co.uk

Helen Waters, Manager, Marketing
helen@infinityia.co.uk, 44 845 603 4110
Barry Walker, Technical Manager
barry@infinityia.co.uk, 44 845 603 4110
Simon Emery, Manager, Sales
simon@infinityia.co.uk, 44 845 603 4110

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Rick Dudson, Manager, Sales
rick.dudson@infortrend-europe.com, 44 0 1256 70 77 00

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WD6 1AG
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www.innovationdp.fdr.com

Chris Warren, European Manager
cwarren@fdrinnovation.com, 44 0208 905 1266

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31 555 384 259
www.iomega.com

Wayne Arvidsan, Director, Marketing
arvidsan@iomega.com, 001 858-314-7024
Akshay Gupta, Product General Manager
guptaak@iomega.com, 001 858-314-7048
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www.komnetworks.com

Glenn Kohut, Vice President, Corporate
glennk@komnetworks.com, 001 613-599-7205
Kamel Shaath, Chief Technology Officer
kamels@komnetworks.com, 001 613-599-7205
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Lucent Technologies
600 Mountain Ave.
Murray Hill, NJ USA 07974
001 636-736-6869
www.lucent.com

Matthias Nass, Director, Technology Strategy & Business Development
mnass@lucent.com, 49 228 243 2400
Harold Smeeman, Director, Technology & Solutions
hsmeeman@lucent.com, 31 35 687 1939
Jan Zuurbier, Director, Channel Sales
zuurbier@lucent.com, 31 35 687 5040

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MaXXan Systems Inc.
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Marlow, Bucks, United Kingdom SL7 1NX
44 0 1628 894355
www.maxxan.com

McDATA SNIA EUROPE

McDATA Corporation
380 Interlocken Crescent
Broomfield, CO USA 80021
001 720-558-8000
www.mcdata.com

Mike Gustafson, Senior Vice President, Worldwide Marketing
mike.gustafson@mcdata.com, 001 720-558-8000
Jean Becker, Vice President, Engineering
001 720-558-8000
Alain Andreoli, Executive Vice President, Worldwide Sales & Services
001 720-558-8000

McDATA is the expert provider of multi-capable storage networking solutions™ – hardware, software and services – that enable partners and customers to network the world's business data™. The company's innovation and experience are behind the success of the most demanding technology companies and their customers.

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7 Avenue des Pommerots, BP25
Chatou, France 78400
33 1 30 09 52 00
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Neartek Inc.
1500 W. Park Dr.
Westborough, MA USA 01581
001 508-475-3300
www.neartek.com

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NetScout Systems (UK) Ltd.
188 Bath Rd.
Slough, Berkshire, United Kingdom SL1 3XE
44 1753 690200
www.netscout.com

Nigel Dowler, Director, European Marketing
dowlern@netscout.com, 44 1753 690207
Andy Burghes, Manager, Systems Engineering
burghesa@netscout.com, 44 1753 690200
Jon Axon, Area Vice President, International Sales
axonj@netscout.com, 44 1753 690200

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Mark Santara, Senior Vice President, Worldwide Marketing
001 408-822-6000
Steve Kleiman, Senior Vice President, Engineering & Chief Technology Officer
001 408-822-6000
Rob Salmon, Senior Vice President, Worldwide Sales
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44 0 1869 278 873
www.netex.com

John Mayo, Director, EMEA Sales
john.mayo@netex.com, 44 0 1869 278 873
Tom Morphis, Vice Fresident, Global Sales
tom.morphis@netex.com, 001 404-240-0916

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PowerQuest

PowerQuest Corporation
P.O. Box 1911
Orem, UT USA 84059
001 801-437-8900
www.powerquest.com

Jackie Brinkerhoff, Manager, Product Marketing
jackie.brinkerhoff@powerquest.com, 001 801-437-8307
Steve Fairbanks, Vice President, Product Management
steve.foirbanks@powerquest.com, 001 801-437-8900
Mark Milford, Vice President, Worldwide Sales
mark.milford@powerquest.com, 001 801-437-8900

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3000 Manchester Business Park, Aviator Way
Manchester, United Kingdom M22 STG
44 0 161 266 1037
www.princetonsoftech.com

Jim Lee, Vice President, Product Marketing
info@princetonsoftech.com, 001 800-457-7060
David Kanaf, Vice President, Product Integration
info@princetonsoftech.com, 001 800-457-7060
Ian Hendersan, Vice President, International Sales
info@princetansaftech.com, 44 0 161 266 1037

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QLogic UK

Surrey Technology Centre, 40 Occam Rd.
Guildford, United Kingdom GU2 7YG
44 1483 295825
www.qlogic.com

Dominic Heath, Manager, Channel Marketing Programmes, EMEA
dominic.heath@qlogic.com, 44 1483 295825
Steve Perkins, Engineer
steve.perkins@qlogic.com, 44 1483 295825
Bob Aitchison, EMEA Regional Manager
bob.aitchison@qlogic.com, 44 1483 295825

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7 Lindenwood, Chineham Business Park
Basingstoke, United Kingdom RG24 8QY
44 1256 818300
www.quantum.com

Marije Stijnen, Manager, Marketing Communications
marije.stijnen@quantum.com, 44 01256 848707
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paul.dunfard@quantum.com, 44 01256 848772

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jsparks@snapappliance.cam, 001 408-879-8700
Joe Disher, Director, Technical Marketing
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Rabert Bingham, Chief Marketing Officer
rbingham@tclaud.cam, 001 425-709-2900
Brian Henling, Vice President, Engineering
bhenling@tclaud.cam, 001 425-709-2900
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Steve Apfelberg

Steve Apfelberg is Senior Director of Sales at Siebel Systems. His responsibilities include setting the business strategy for the Siebel Sales product line and working all aspects (sales, marketing, partners, customers) to achieve business goals. Furthermore, Steve is responsible for messaging around the product line, identifying key best practices and business processes and helping get them built into out-of-box product. Steve holds a Bachelor's Degree in Economics from Stanford University.

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A few minutes with Steve Apfelberg, Senior Director, Siebel Sales

Sales Force Automation

> What do you find is driving the adoption of SFA applications today?

Whereas primarily early adopter clients purchased SFA in the first couple of years that SFA applications existed, companies across all industries are purchasing them today. While the profile of companies that purchase these applications has changed, the drivers remain the same: to enable companies to grow revenue more quickly, predictably and profitably. In today's economic conditions, reaching that goal is more crucial than ever. Since the SFA application market is more mature, customers have higher expectations for the software against tighter budgets than ever before.

"SFA applications enable sales professionals to spend more work time on selling."

> What benefits can companies achieve through the implementation of SFA capabilities?

SFA applications enable sales professionals to spend more work time on selling by reducing the amount of time it takes to handle administrative tasks. As a result, companies can expect revenues to grow more quickly, predictably and profitably because SFA applications enable sales professionals to focus on the right deals at the right time. In addition, SFA applications can help professionals identify cross-sell and up-sell activities in accounts, which enables then to increase revenue per customer.

> What are companies looking for in terms of next-generation SFA capabilities?

In addition to operational capabilities, customers are now looking for analytical functionality that allows them to perform tasks such as:

- Pipeline Analysis: the ability to look at the sales pipeline from a number of angles.
- Team Performance/Sales Effectiveness Evaluation: the ability to evaluate the performance of a given representative, or groups of representatives, by region, sales team, etc.
- Territory Insight: the ability to perform analysis on how the salesforce is doing by territory, or compare one territory to another.

> How should companies approach an implementation?

First off, the customer should begin by appointing an executive owner of the project. Next, it is important to conduct a business process review and make business process changes before implementing. Once it is time to proceed with implementation, we recommend implementing broadly before deeply; for example, deploying limited functionality to all of the channels that support a particular type of customer. Finally, it is important to remember that one size does not fit all.

> What are some methods to increase user adoption of a new SFA system?

One thing that is critical is full executive adoption of the SFA system. Unless the sales force sees that executives are also using the SFA solution, they are likely to view the system with skepticism. Executives should strive to make the SFA system the primary means by which the organization communicates about sales opportunities; the system should become as integral to business operations as the telephone, voice mail and email.

> What best practices/business processes are typically built into SFA applications?

Business processes that support common sales functions such as lead routing, opportunity management, forecasting, territory and quota setting and alignment are core to SFA applications. Some applications, however, have gone so far as to build best practices for these processes into their software. For example, Siebel's triangulated forecasting functionality enables customers to use that best practice for the forecasting business process. Additionally, some SFA applications include functionality around selling methodologies—such as target account selling—that support companies that use these methodologies.

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Mercury Broadens IT Management Line

BY LINDA ROSENCRANCE

Mercury Interactive Corp., known primarily as a vendor of software testing tools, last week announced a broader line of products for automating the process of managing IT systems and operations.

The expanded offering includes integrated sets of software and services targeting IT governance, software quality control, performance management and application availability (see box). Zohar Gilad, vice president of products at Mercury, said the Sunnyvale, Calif.-based company has added new tools and reorganized its existing ones to fit the four product groupings.

Gilad said Mercury is focusing on three strategic IT functions as part of the broadened Business Technology Optimization product line: governing IT departments and managing project portfolios, the delivery of applications to corporate business units, and managing systems to make sure they work properly.

AutoOne Insurance, a startup in Melville, N.Y., turned to Mercury's tools last year to expedite the setup of its applications. Virginia Linick, AutoOne's vice president of IT, said her staff had just eight months to do the job and had to get it right the first time.

Linick licensed some of Mercury's quality control and performance management tools and brought in staffers from the vendor as consultants. Mercury helped AutoOne buy equipment, made recommendations on how to size the systems and tuned the applications to meet performance targets, she said.

David Wollin, managing director of emerging technologies at AXA Financial Inc., said his company has used Mercury's testing tools for four years. "It's helped out the business by improving the [applications] we actually deliver to our customers and to our employees," he said. "And the quality of the product is better on Day One."

By using the automated testing tools, New York-based AXA has also sharply reduced the time and the amount of IT resources needed to get applications out the door and into the hands of end users, Wollin added.

"Instead of having 12 people worrying about testing, I've got three or two," he said.

Mercury bought its IT governance tools through an acquisition of Sunnyvale-based Kintana Inc. that was completed in August. Glenn O'Donnell, an analyst at Meta Group Inc. in Stamford, Conn., said the software automates the management of IT procedures — "not so much dealing with the nuts and bolts but the actual operational processes."

Depending on which pieces of the four product sets a customer licenses, pricing could range from $15,000 to millions of dollars, said Christopher Lochhead, Mercury's chief marketing office. **41641**

ANNOUNCEMENTS

Mercury's New Product Lineup

IT GOVERNANCE CENTER: Software originally developed by Kintana for managing IT strategies, resources and project portfolios

QUALITY CENTER: Application and business-process testing tools designed for use by quality assurance teams

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CA 'Needs to Think Bigger,' New Exec Says

Product development chief Barrenechea talks about life after Oracle

BY MATT HAMBLEN, MARC L. SONGINI AND DON TENNANT

Mark Barrenechea *became senior vice president of product development at Computer Associates International Inc. in June after leaving his previous position as a senior vice president and a member of the executive management committee at Oracle Corp.*

Barrenechea, who exited Oracle on the day the software vendor announced its hostile bid to acquire rival PeopleSoft Inc. — a coincidence, he says — spoke last week with Computerworld *about his first 100 days at Islandia, N.Y.-based CA. Excerpts follow:*

Is there anything about Oracle's corporate culture that you're trying to instill at CA? The thing I liked about the Oracle culture is it's a big company, and it dominates in particular spaces. CA needs to think bigger in many, many ways. So if there's one aspect of the Oracle culture that I want to replicate, it's to think big. We can change a lot of things with an integrated suite of management software.

Conversely, is there anything about CA's culture that you think would be useful at Oracle? CA has a very unique culture. It's a collegial environment, which is a breath of fresh air. You can share ideas in an open forum; you can debate in an open forum. He who yells loudest isn't the one that's heard — it's a good way to run a company. I'm not suggesting Oracle isn't run that way, but perhaps not as much so.

Sun Microsystems recently introduced a per-employee software pricing plan [QuickLink 41523]. What's CA doing to make life easier for IT managers in this area? Pricing is complicated. Sun is making it as simple as they can, which is a good thing.

You look at Microsoft — one of the things that frustrates me about Microsoft pricing is we have 16,000 employees at CA. Each one licenses Office, but at any given time, maybe 11,000 to 13,000 employees are using it. So my high-water mark for using Microsoft software is a good 30% to 40% below what I'm paying. And I don't like it. That cannot stand over time. The Microsoft model has to change.

CA took some very aggressive moves two and a half years ago when we moved to usage-based pricing. We believe that the best way to charge for software is based on what [customers] use.

We made that transition. Microsoft hasn't made it; Oracle hasn't made it; IBM hasn't made it. Sun looks like they're starting to make that transition in the one lever they know how to pull, which is per-employee. I think you'll see more of this in the industry, because CIOs will demand it.

How important is Linux in CA's product strategy? If you look at the IT infrastructure of the future, you can easily envisage three major platforms: big-iron, enterprise-class mainframes for data protection and transactions; [Windows] NT for domain access, security, e-mail and maybe some file sharing; and large-scale Linux clusters for storage and applications. Linux is fast and inexpensive; it's relatively easy to manage. Clustering is getting simpler and simpler, to make 100 Linux machines look like one.

Unix is conspicuous for its absence from your list. What's the future of Unix? It's Linux. I firmly believe it. I think we're one to two years away from massive Linux clusters becoming the second or third [most] prominent architecture within an IT infrastructure. ◗

CA Ships First Piece of Sonar Technology

Starting to deliver on the automated management tools strategy it announced in July, Computer Associates has quietly begun shipping new software that's designed to collect information about network traffic and then analyze the data for IT managers.

The Unicenter Network Forensics product is one of the initial components of Sonar, a planned set of tools partly based on software that CA acquired from defense contractor Raytheon Co. in Lexington, Mass., during the summer.

CA demonstrated Sonar at its CA World 2003 user conference and said the technology will support on-demand computing installations, in which servers can be dynamically allocated to run different applications as data processing needs change [QuickLink 39965].

Unicenter Network Forensics became available earlier this month.

Mark Barrenechea, CA's senior vice president of product development, said the software can send reports about the network data it gathers to CA's Unicenter management console for use by IT administrators.

CA is also working on a related product called Unicenter Network Diagnostics, which is due next year. The diagnostics software will be designed to examine network traffic patterns in real time and compare them with historical data in order to establish performance benchmarks, Barrenechea said.

A third product in the wings is Unicenter Business Process Maps, which will give IT workers a graphical view of their corporate computing resources. That application should be ready for release in the first half of 2004, Barrenechea said.

Clark Ammons, a production and systems manager at Washington University in St. Louis, said he has yet to fully research the Sonar products to see if IT officials at the school can justify a purchase of the technology.

But, he added, the mapping tool sounds particularly interesting. "I'm a visual person," Ammons said. "I like to see things."

However, Amy Wohl, an analyst at Wohl Associates in Narberth, Pa., said potential users may be confused about how Sonar technology fits with CA's existing Unicenter suite.

"The fact is, there are lots of tools from CA, IBM and HP to analyze data," she said. "So IT managers will have to figure out how Sonar works and how to use it with old tools, or which ones to replace."

– Marc L. Songini and Matt Hamblen

MORE ONLINE

To read the full interview with Barrenechea, go to our Web site:

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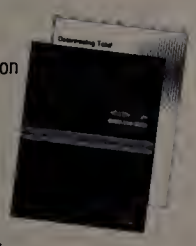

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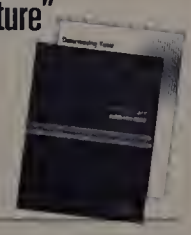

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by Russell Senesac
InfraStruXure Product Manager

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MARYFRAN JOHNSON

The Innovation Quest

EVERYBODY LOVES to talk about innovation, but try finding two people who can agree on exactly what it is. That was probably the case back in 1548 when the word first surfaced in the English language. Yet here we are, centuries later, still poking around on this eternal innovation quest.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

Is innovation a great new idea, a more creative approach or anything novel enough to create value or competitive advantage? Google the word and you get 10.2 million hits, so there's an endless loop of information and opinion about it. But the question that keeps surfacing in this anemic economy is whether we should be worried about the health or even survival of the innovative IT spirit.

Are we stuck in the status quo?

Our lead story in this week's Management section ("Innovation Interruptus," page 41 and online at QuickLink 41357) does make the point that IT innovation — the sort that brings about real change in computer systems or business processes — has taken a beating in the budget drought. We conducted an online survey among 106 IT professionals, and 70% of them said they had watched innovative projects get dropped by their departments in the past two years because of cutbacks. Instead of pushing new IT investments, 51% of our survey respondents said they're focused on making existing technology more cost-effective as they re-engineer business processes.

This batten-down-the-hatches approach has vendors like Microsoft raising alarm about an "almost dangerous complacency about innovation," as CEO Steve Ballmer put it in a recent speech. I suspect he's more worried about Microsoft's bottom line than the future of innovation, but you can't blame him for wanting to draw attention away from the relentless publicity about Windows security flaws.

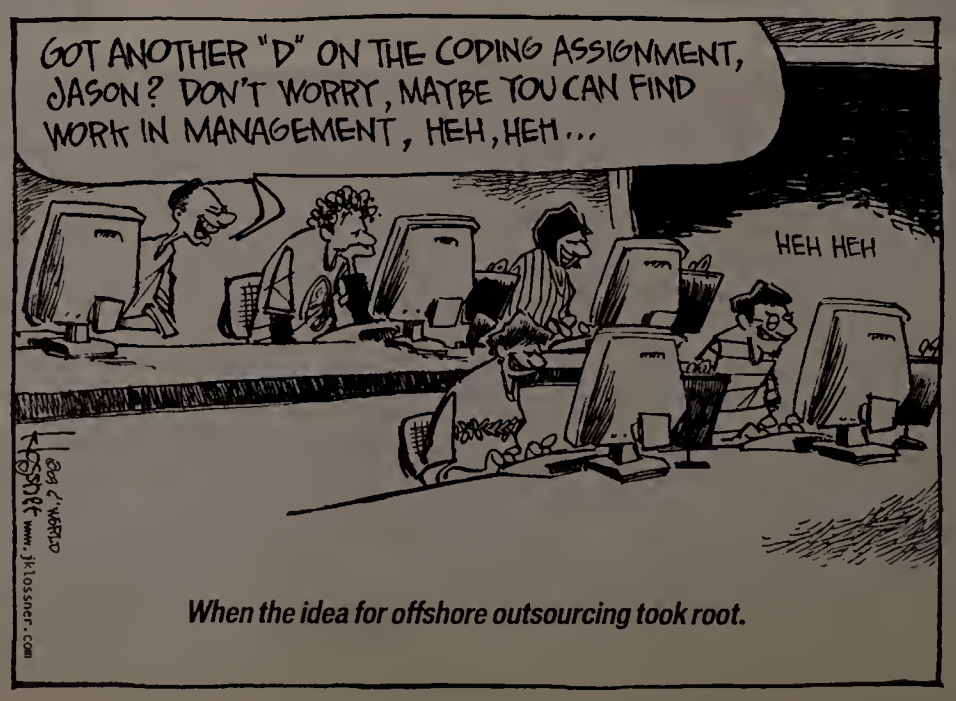
In the meantime, there are signs of innovation bubbling up in certain segments of the industry, if our Innovative Technology Awards 2003 [QuickLink a3630] are any indication. We found technologies being creatively applied just about everywhere: Web site and data management, CRM, wireless, security, networking, storage, enterprise systems, application development and supply chain. Most important, the nominations for these awards came directly from IT managers and end users, not from vendors' skilled spinmeisters.

Last year, our awards program drew 200 nominations. This year, we nearly doubled that with 350 nominations. Doesn't look like such an innovation drought, does it?

In 2002, most of the innovative technologies centered on products with clear and measurable ROI, immediate payback or customer satisfaction boosts. This year, the definition of innovation broadened in scope. It moved outward to areas like regulatory compliance tracking, reliance on open standards as a way to cut costs, reducing complexity, optimizing business processes or providing data access through multiple channels.

One winner was the OneBridge Mobile Platform from Extended Systems Inc., which enables a variety of mobile devices to access corporate data and applications in real time. The product put wholesale food distributor M.R. Williams Inc. in a position to outrun its competitors with a unique inventory management tool. That led to a 34% increase in sales. IT director Jane King quotes her CEO, Mike Williams: "We can compete on price or service or fast delivery, but everyone else is doing the same sort of thing."

And doing the same sort of thing is status quo, which nobody has trouble defining. So perhaps the truest definition of the innovation quest these days is this: whatever gets you to the flip side of the status quo, into genuine change and accomplishment. 41635



When the idea for offshore outsourcing took root.

PIMM FOX

Extend And Win

THE REAL nitty-gritty of enterprise application integration is the notoriously difficult task of opening up legacy systems to distributed end users. The problem isn't so much that legacy applications are cumbersome to use. Rather, the ability to centrally manage your applications, deploy new ones to users and make on-the-fly modifications to up-and-running applications poses stumbling blocks for IT managers whose companies run business logic at the edges of their networks.

Another problem is that developers familiar with Java, .Net and other object- and/or service-oriented languages may have little experience with Cobol and other mainframe languages. Yet business requirements necessitate that these barriers between developers be torn down. EAI solutions must come with tools and a user interface that interacts with the host so developers can understand what an application on the host does, without having to know how it works.

PIMM FOX [illegible] writer in S[illegible] Calif. Co[illegible]

New tools — connectors, if you will — from IBM, NetManage Inc. and Attachmate Corp., for example, make it possible to turn Cobol-based transactions into Web-accessible functions. When using these connectors, there's no need to change the legacy applications. The process involves delivering host-based information as XML, Enterprise JavaBeans or COM+ (or any other component technology), making it simple for applications to use.

Think of it as marketing the application internally, letting developers communicate what's available.

That was the rationale behind work at Poste Italiane, Italy's national postal service. R&D director Alessandro Saralli said they were looking for fast implementation, configuration and personalization (it took less than a week for a proof of concept) and a standard Web development language. This pointed Poste Italiane toward Bellevue, Wash.-based Attachmate's Connector

Services and Smart Connector.

Saralli wanted to give every post office in Italy access in a Web-ready format to an existing bank-account application. His goal was to tie the venerable OS/390 system at headquarters to the Visual Basic environment in each post office. This VB world had its own business logic, which had to be synchronized with the mainframe in order to use the application. It was too complex, so no one ever did it. Using Smart Connector technology, his developers were able to remap the mainframe's business logic to every local server. That means the remapping had to be done only once and from headquarters. Now the application is in wide use.

As business process becomes more complex and demanding, IT has to find a way to respond by reaching into the rich asset base of legacy applications. Using connector technology to expose functions to Web-based clients is a valid and proven approach. 41549

DAN GILLMOR

Open-Source Under Fire

A LITTLE MORE than two years ago, a senior executive at Microsoft made an implicit threat against the open-source movement. Open-source software, he suggested, might violate his company's intellectual property.

It was a threat to take seriously, because intellectual property laws have always been the snake in the grass when it comes to open-source's long-range viability. For IT, the question is whether there will be any refuge from a world dominated by a few greedy, arrogant giants if open-source becomes a tool no one dares to use. The signs aren't good right now.

So far, Microsoft hasn't directly carried out that threat. That dubious distinction has fallen to the widely loathed SCO Group, which has launched a campaign of fear, uncertainty, doubt and lawsuits against Linux.

Indirectly, of course, Microsoft (and Sun Microsystems) are helping SCO by paying licensing fees that have helped fund SCO's legal pit bulls. By an amazing coincidence, Microsoft and Sun have the most to lose from Linux's rise.

A key question, yet to be answered, is whether users can be held liable if an open-source developer does put infringing code into a product. (Keep in mind that SCO hasn't persuasively shown such infringement.)

If so, the logic that puts users in that position is bizarre — and dangerous. If I buy a book whose author has plagiarized passages from someone else, I'm not liable. Nor should a user of open-source software be liable in analogous circumstances. That's one reason why SCO's threats against users are so obnoxious.

DAN GILLMOR is technology columnist at the *San Jose Mercury News*. Contact him at **dgillmor@sjmercury.com.**

SCO's action against IBM at least has some logic in this respect, because SCO is attacking an allegedly infringing developer and seller of open-source products. But what happens when proprietary software companies start suing individual contributors to big open-source projects?

Anyone can sue anyone else. That's a good thing, because it means (in theory) that the small guy can seek justice. But today's legal system isn't as much about justice as it is about money and time. Many innocent defendants settle because it would be too expensive to mount a winning defense, however unfair that may be. This keeps happening in part because judges have shown a craven unwillingness to punish plaintiffs who bring bogus actions.

IBM can defend itself, and the open-source community is doing a bang-up job of showing that SCO's would-be emperor has yet to put on any clothes. But if IT wants to preserve open-source as a serious option, more concerted action may be required, because this kind of stuff seems likely to continue no matter what happens to SCO.

IT needs to push for more legal clarity — and for judicial sanctions against abusers of intellectual property laws. The future of open-source may depend on it. 41545

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READERS' LETTERS

On Incoming Grads

IN READING Thomas Hoffman's article "Preparing Generation Z" [QuickLink 40537], it occurs to me that I haven't met an IT graduate in the last 10 years who has taken fundamental courses like data structures or operating systems. The article contends that IT graduates need more business knowledge; I say they need more technical basics. Ask today's graduate what a stack or a queue is, and you'll be met with a blank stare. Colleges and universities need to get back to high academic standards. Business people need to learn how to articulate business needs. IT people need to learn how to interpret those needs. Instead, academia tries to be profitable, business people try to understand IT, and IT people try to learn about business. The solution is simple: Know your business, stick to it, and do it well.

John Regep
Manager, systems development, St. Louis Park, Minn., johnregep@aol.com

HAVING JUST graduated with my master's degree in management, I would like to offer a student's perspective on the article "Preparing Generation Z." Technology and business requirements change so fast that it isn't possible for academia to react. If students' course requirements were to constantly change with the whims of business and the IT industry over a four-year period, students would never be able to meet the *current* requirements to graduate. Even a two-year master's program can be dated by the time the student earns the degree. How many graduate students started their graduate programs in 2000 when e-commerce was still the rage, only to find out in 2002 that systems integration was the new skill companies wanted?

Jon J. Banks
Powder Springs, Ga. pilot@ILoveToFly.org

THE LAST THING we need is an army of project managers coming out of school who know nothing about logic, mathematics, language theory, philosophy, etc., and everything about schedules and staffing.

Roland Trevino
First vice president, MBNA Corp., Newark, Del., Roland.Trevino@mbna.com

IT'S LAUGHABLE to read that CIOs assert that universities "shouldn't be teaching to a particular technology." Never in my life have I seen a job advertisement that didn't demand knowledge of a particular technology, and usually it's at least a dozen particular technologies.

As an IT professional, I agree that every technology can be learned in a short time by a well-educated professional. The thing is, this reasoning will hardly ever get you a job. Just ask your CIO how many people he's hired lately who understood software engineering methodology but hadn't learned Java or C++. Or how many people he's hired because of their communication or analytical skills. All this is nothing but Sunday talk. In my experience, managers never know what they really expect from university graduates. Blaming universities for not doing a good job is just an easy excuse.

Toni Menninger
Quebec

Grimly Funny

MARK HALL'S ARTICLE about looking for new places to outsource was really funny [QuickLink 40663]. He quotes someone who says we should look to Egypt, Jordan and Lebanon. Good plan. According to the latest terrorist report, Egypt harbors three known terrorist groups, Jordan one and Lebanon 11.

Donna Sheain
Atlanta

Wasted Automation

THE ARTICLE "Drugstores Embrace E-prescription System" [QuickLink 40811] includes this statement from Jim Smith of CVS Inc.: "But even more important is the expectation that automating the prescription process will reduce medical errors and free pharmacists to spend more time with customers." I don't have much faith in that. In my experience, automating such tasks only makes detecting errors somebody else's job. And as far as giving pharmacists more time with customers: No, it will just mean that more work for them will arrive faster, because there's another path besides the store door.

I hate to be pessimistic, but I've just spent the last two or three years (I've lost track of time) implementing an electronic patient record system for a 30-physician practice that has over 50,000 patients. However, don't let my attitude affect your reporting; you are doing an excellent job. It's just that sometimes people make ridiculous claims for the improvement in lives that computer automation can make.

Geof Rarick
Database/network administrator, Thoracic & Cardiovascular Institute, Lansing, Mich., grarick@tciheart.com

No to Muckraking

THE ARTICLE "Blaster Worm Linked to Severity of Blackout" [QuickLink 40999] was poor journalism. By the author's own admission, he can verify little as factual. The danger is that some will take this unsubstantiated message as gospel and drag the virus writer, Microsoft and the utilities through the muck.

Jim Johnson
Owner, Serenity Consulting, Laurium, Mich.

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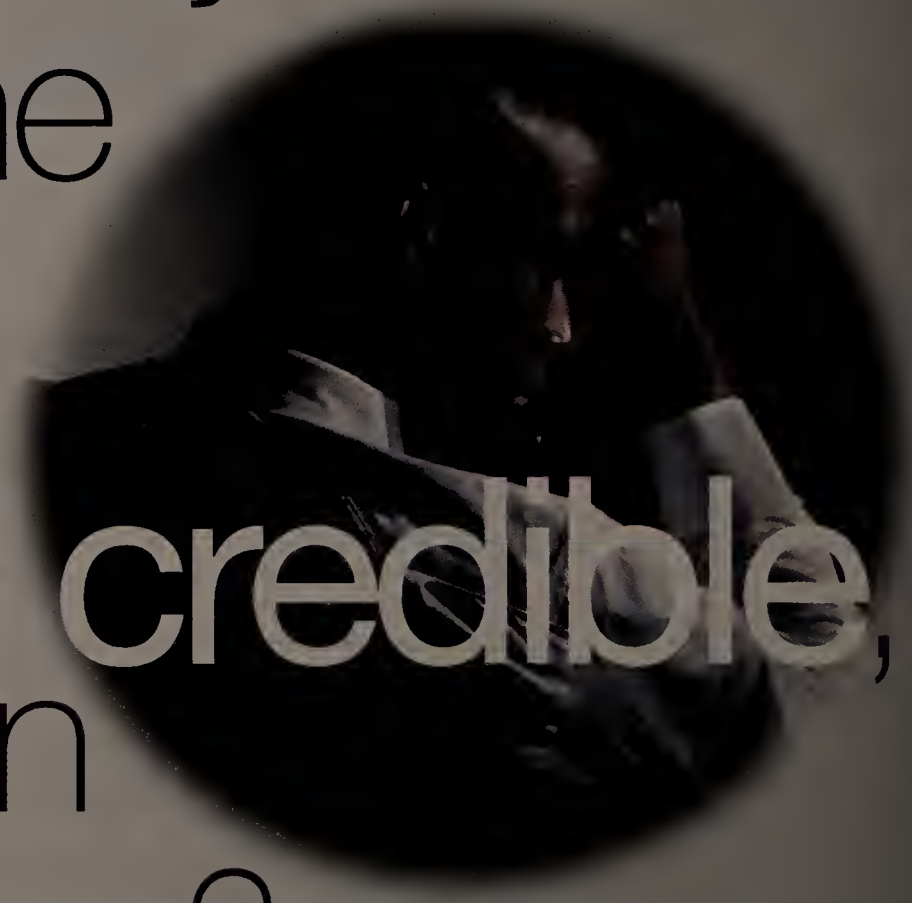

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Solid Boost to I/O Speed

Solid-state disk appliances promise to boost the performance of deskbound applications, but high cost has limited their adoption. **Page 32**

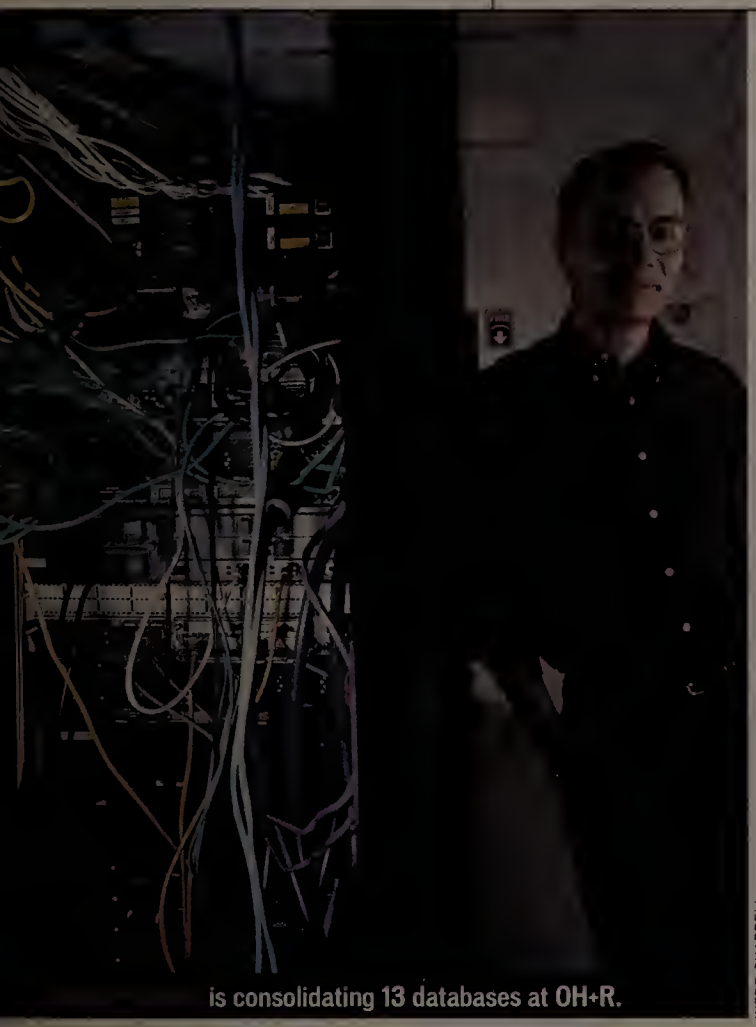
FUTURE WATCH

Supercomputing Horizons

Ford Motor Co.'s Vincent F. Scarafino says that without government help, the U.S. will fall behind in supercomputer technology, and the country's science and industry will suffer as a result. **Page 33**

Expanding Roles for Identity Management

As applications and users multiply, companies are turning to ID management software to improve access to applications, password management and the provisioning of resources. **Page 34**



is consolidating 13 databases at OH+R.

WEBB CHAPPELL

Growing Into a DATA CENTER

As this health care provider expanded, it moved to solve scalability problems by building a high-availability data center. By Robert L. Mitchell

FIELD REPORT

TO CALL THE CHALLENGE facing Mark Flieger a scalability problem would be an understatement. When he came aboard as vice president of information services at Occupational Health + Rehabilitation Inc. three years ago, the Hingham, Mass.-based health care provider had nearly $60 million in revenue, 35 offices from Maine to Missouri, 550 employees, a double-digit growth rate — and a centralized software application running the core business built on top of dBase and MS-DOS.

OH+R owns and manages occupational therapy clinics that treat many patients with on-the-job injuries. Its information system must deal with patients as well as with the employers that are the payees under state workers' compensation laws. As OH+R expanded to more states, the company had stretched its software, Systoc, from Occupational Health Research Inc. in Skowhegan, Maine, to its limits.

OH+R had never upgraded its copy of Systoc to a newer, more network-friendly client/server version. As a result, the dBase version performed poorly over the WAN links connecting OH+R's offices. To work around that, OH+R added Citrix Systems Inc. MetaFrame servers, which ran user application sessions locally and sent only screen images and keystrokes back and forth to end users over the WAN. But Systoc wasn't designed to scale beyond a single state, so the business ended up creating and maintaining 13 separate databases as it grew.

"We've had all kinds of business issues around maintaining 13 data stores," Flieger says, not the least of which has been the need to maintain multiple sets of reports — more than 1,000 of them — due to duplication across databases. "Enterprisewide reporting was not possible," says CEO John Garabino.

Billing couldn't run reports efficiently across the databases, and differing database schemas and payer-identification naming conventions made even manual reporting difficult, says Patti Walkover, vice president for contracting and reimbursement. And those reports that the staff could run bogged down system performance, says Flieger. "It doesn't take too many reports to slow down a transaction system, and people in the clinics would really feel that," he says.

Managing the system for high availability was difficult. "Our data center was more like a suite in an office building," Flieger says. "All the inherent maintenance of the back end was problematic." But since every office depended on the system for patient scheduling and billing, availability was a priority.

Today, OH+R has built its first high-availability data center in nearby Norwell, Mass., and it's slowly consolidating its offices onto a new client/server version of Systoc. The new software includes a clustered SQL Server 2000 back end with a separate SQL Server data mart designed to speed financial reporting and move report generation off the production system. The client software, written in Visual Basic, is served up to Wyse 8235 Windows thin-client terminals by way of a MetaFrame XPe server farm.

Remote offices connect through frame relay over Asynchronous Transfer Mode WAN links, while remote workers equipped with laptops can access the system over the Internet through an integrated MetaFrame Secure Sockets Layer virtual private network feature called Secure Access Manager. Two years into the project, Flieger has offices in three states cut over to the new system. He hopes to have the rest of the offices switched over by year's end.

First Steps

Flieger started the process by reviewing Systoc. Occupational Health Research had a newer client/server version, but he was skeptical that the vendor, a small company used to dealing with small clinics, could support OH+R's growth plans. But only one other small vendor had the capabilities he needed. "There are some unique business rules that cause us not to be able to use mainstream practice manage-

FACT SHEET

Occupational Health + Rehabilitation Inc.

Hingham, Mass.

GOALS: Migrate practice management system from 13 dBase databases to a single data store. Build high-availability data center; minimize bandwidth requirements across frame-relay network.

METHOD: Use thin clients and Citrix MetaFrame server farm front end with back-end SQL Server database. Use Fibre Channel storage arrays and RAM disk to maximize database performance and packet-routing appliances to optimize WAN bandwidth.

PROJECT COST: $1.6 million, including $400,000 in server gear.

RESULTS: Improved reliability and uptime, consolidation of 13 databases into one, which reduced redundant reports and enabled comprehensive automated enterprisewide reporting for the first time.

ment software," he says. Users were also frustrated with Systoc, which they saw as slow and difficult to use. Flieger decided that better user training and a system upgrade could solve most of the problems, but scalability remained a concern. "Nobody had ever taken Systoc to the level where we had taken it or where we were planning to take it," says Garabino. OH+R would need to do its own scalability testing.

Infrastructure Basics

Next, Flieger turned to the infrastructure. He presented his case to Garabino for building a high-availability data center and began planning a highly redundant systems architecture that included uninterruptible power supplies and backup generators. He also wanted to keep the thin-client system in order to minimize field-support demands on a staff of seven.

"We're trying hard to keep servers out of our edge sites because of remote management issues," Flieger says. And he wanted to keep WAN costs, already more than $500,000 per year, under control.

Paul Venezia, senior engineer at Keene, N.H.-based IT service provider IniNet Inc., had something that seemed to fit: a Compaq-commissioned design for a high-availability application service provider reference architecture based on Citrix's MetaFrame XPe. IniNet agreed to adapt the design to OH+R's needs.

The new design stresses availability and addresses a potential weakness of using Windows terminals. "The loss of the data center means people are sitting on their thumbs. It brings added pressure on the core network to perform and maintain as high a level of availability as possible," Venezia says. Flieger shared this concern. "The con to thin client is that you put all your eggs in your network basket," he says. "If that network goes down, you're hosed."

The new architecture includes a 12-server front-end MetaFrame server rack, a back-end SQL Server and SAN rack, and a management server rack, each on its own virtual LAN segment. The rack servers, 1U (1.75-in.) dual-processor Hewlett-Packard ProLiant DL360s and DL760s, have redundant network adapters for each segment to which they connect, and servers on all three VLANs have six adapters. To minimize wiring problems, Venezia mounted dual Cisco Catalyst 3550 switches atop each rack, which allows OH+R to run just two fiber cables back to the core switches.

Although MetaFrame kept bandwidth requirements per session down to about 20Kbit/sec., Venezia added PacketShaper application-layer traffic-optimization appliances from Packeteer Inc. in Cupertino, Calif., to give Systoc traffic priority. The appliances give administrators more control of available bandwidth, but they required publishing individual applications as icons within MetaFrame's NFuse portal interface rather than publishing a single, more user-friendly Windows desktop. The PacketShaper appliances also control Web browsing bandwidth and smooth out report-printing traffic by giving those packet types a lower priority. The savings add up, Flieger says. "Adding a single-channel 64Kbit line is about $40,000. We're running our network probably at about half what others are," he says.

To address database scalability and performance concerns, the design includes direct-attached HP StorageWorks MSA 1000 Fibre Channel storage arrays, one for each SQL Server system. Flieger also accepted Venezia's recommendation to put the SQL Server database transaction log onto a 16GB RAM disk, called QikData X3, from Platypus Technology Inc. in Billerica, Mass.

"That shifts the bottleneck out to the processor and memory and gets it off the disk I/O," says Flieger, who acknowledges that he was initially concerned about reliability and support of the 3-year-old vendor. But the X3's ability to partition memory banks into two mirrored 8GB virtual disks and to automatically write memory content to an internal hard disk in the event of a power failure allayed those concerns.

OH+R has 250 concurrent users today, but Flieger wanted to see Systoc scale to 600 concurrent users to support future growth. IniNet arranged for the use of servers and lab time at HP's benchmark center in Baltimore, while OH+R sent staffers to develop and administer the testing scripts. "They banged the hell out of those servers," says Flieger. The test system ran out of gas at 300 users.

The problem was a process that passes Windows authentication to SQL Server. Turning that off cut processor usage by 30% but required a generic SQL Server user ID and password to avoid an extra user log-in. In doing so, Flieger lost the ability to associate SQL Server database log activity with specific users. But when the number of concurrent users reached 600, he decided to continue with the migration.

Fresh Start

Flieger and his staff came up with a consistent schema for the new database but still faced integrity problems with the existing data. So OH+R broke with its past. The old systems would be maintained as "accounts receivable" databases for another 12 months, while the production database and schema would start anew. "It made sense for us to start fresh," says Walkover. After about a year, the old database will be phased out, says Ken Martin, vice president of customer relations at Occupational Health Research.

For its first migration, in Warwick, R.I., OH+R spent two months doing eight test data conversions, going back each time to fix problems. On May 19, the "technical go-live" date, the final data conversion began. Users could enter patient information and scheduling data, but not billing information, for the first two weeks. The new system finally went live for billing on June 2. "It was the smoothest conversion I've ever seen. We didn't have a single phone call," says Martin.

Users now have access to Exchange e-mail, Microsoft Office and Systoc through the NFuse portal. Flieger will begin planning the migration of OH+R's human resources and accounting software next.

Garabino predicts "huge" savings in billing and collection, since that's where the system has been weakest. But he also expects smaller gains from improved business processes. "There will be productivity improvements related to the system all over," Garabino says. **41426**

SELLING THE CEO

The head of OH+R wanted more than just ROI:

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Mainframe Redux?

As OH+R began designing its new data center and information system, CEO John Garabino left most of the decisions to his IT staff, but past experience left him with a strong bias against one technology option. Garabino had been burned at his previous company after approving what turned out to be a very expensive system based on an IBM System/36 minicomputer. This time, he says, "the only thing I said was it absolutely had to be PC-based, and I didn't want to hear anything about minicomputers."

That didn't appear to be a problem at first. But Flieger's data center design, with its Windows terminals and MetaFrame back end, looked a lot like the old mainframe-based time-sharing model to Garabino, and Mark Flieger, vice president of information services, had to explain how it was fundamentally different.

The new system is, however, the same as a mainframe in one respect, Flieger says. "It's awesome when somebody can call you and say they need access to an application, and within 30 seconds, they're staring at it," he says.

But Garabino was put off by the "glass room" data center concept. "I said, 'Wait a minute, are we going back to the old computer room? If you start talking about raised floors and air conditioning, I'm going to be very nervous,' " he says.

So Flieger ended up explaining the intricacies and benefits of PC virtualization technology, client/server architecture, centralization of critical IT assets and how the new system is both similar to and different from the traditional mainframe architecture.

Garabino is now sold on the new system but acknowledges that it still sounds a bit like the old mainframe architecture to him. "What goes around comes around," he says.

– *Robert L. Mitchell*

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Solid Boost to I/O Speed

Solid-state disk appliances are expensive but promise to give disk-bound applications an extra performance kick. By Robert L. Mitchell

THE UNISYS MAINFRAME at Greater El Paso's Credit Union had run out of steam. Response times had slowed to unacceptable levels as transaction volumes climbed to 135,000 per day, and completion times for nightly batch-processing jobs stretched to seven hours. Meanwhile, new regulations forced the credit union to keep systems online longer, leaving only a six-hour window to complete those jobs. "We needed to do it faster," says Rudi Kuehne, senior vice president of data processing.

After identifying database I/O as the bottleneck, Kuehne upgraded to an EMC Clariion storage array. That helped, but the problem didn't go away. "Even with faster disks, we didn't gain enough time to satisfy the operational requirements," he says.

Kuehne considered replacing the entire mainframe but instead spent $219,000 earlier this year on a solid-state disk (SSD) appliance from Texas Memory Systems Inc. in Houston. By moving key database files onto the 32GB device that functions as a giant RAM disk, the credit union cut per-transaction response times from 0.6 to 0.35 seconds. Nightly batch-processing times dropped to four hours. "This saved us from spending $2.5 million on a new mainframe," he says.

Prices are Falling

SSD devices have been around for more than 25 years, but high costs have kept them out of most data centers. However, as the cost per megabyte has plummeted relative to traditional disk storage (see chart), SSD appliances have found limited acceptance in areas such as online transaction processing and video editing, where extreme disk I/O loads may outpace even very fast storage arrays.

SSD has several benefits, says Peter Gerr, an analyst at The Enterprise Storage Group Inc. in Milford, Mass. "It delivers excellent performance. It is nonmagnetic. There are no rotating components, so there is very low latency," he says. SSD access times range from 0.01 to 0.1 msec vs. 4 to 10 msec for the most advanced, 15,000-rpm disk drives.

But despite declining costs, SSD technology is still expensive compared with rotating disk systems. SSD appliances average about $1.85/MB, whereas disk prices range from 2 cents/MB for low-end Advanced Technology Attachment (ATA) devices to about 7 cents/MB for high-end EMC Corp. storage arrays, Gerr says. Low-end SSD appliances start at about $3,000, and high-end models with 1TB of storage can run well over $1 million.

Since there are no moving parts, SSD systems are very reliable, and all products offer the same basic features. They use synchronous dynamic RAM, support data mirroring between banks of memory and include a backup battery and a hard disk onto which the system can automatically write the RAM disk contents in the event of a power failure. "It is the integration of the components that is the differentiator, and the software they offer," Gerr says.

VENDOR LINKS

For a list of SSD subsystem vendors, go to our Web site:

QuickLink 41401
www.computerworld.com

Tech for Many Tasks

Vendors claim their appliances can do everything from expanding the number of user sessions a single Citrix Systems Inc. MetaFrame server can support to speeding up e-mail system performance and restoration times. For example, Solid Data Systems Inc. in Santa Clara, Calif., offers high-speed recovery software for Microsoft Exchange servers. TiGi Corp. in Vienna, Va., offers hybrid RAID/SSD appliances and software that allows for snapshot backups of the RAM disk contents. And Texas Memory Systems stripes data backups across three hard disks in its appliance to allow continuous trailing backups of RAM disk contents.

Despite these features, few end users are aware of SSD, says Gerr. "In the financial industry, it's pretty well known. Outside that, it's in an early-adopter phase," says Woody Hutsell, executive vice president at Texas Memory Systems. And only a handful of small vendors offer the appliances, which caused concern for Kuehne, who was looking for a stable vendor with enterprise-class support. "After some soul searching, we decided that it was worth the risk," he says, adding that he checked the vendor's financial viability before proceeding.

Stability also worried Mark Flieger, vice president of information services at Hingham, Mass.-based health care provider Occupational Health + Rehabilitation Inc., which put the transaction logs for its disk-bound SQL Server database on a $20,000 SSD appliance from Platypus Technology Inc. in North Billerica, Mass. He says the system's redundancy and the ability to move operations to disk in the event of failure convinced him to take a chance.

The limited number of SSD deployments also means that the appliances haven't been tested with many systems. "I would ask, 'Can this device coexist with my other systems, or will it just increase the complexity of my environment?' " says Gerr.

In Kuehne's case, the system didn't work with his mainframe, even though both Blue Bell, Pa.-based Unisys Corp. and Texas Memory Systems had said it would. "We were told it was certified to run on [Unisys] mainframes, but it had never been certified on our model," he says. The Unisys system interface wasn't designed to accept data at RAM disk speeds and timed out. The two vendors eventually remedied the problem with a microcode update for the Unisys hardware, but the process kept the system off-line for six weeks.

Who Needs It?

Charles Miller, senior vice president of data center engineering and operations at KeyCorp in Cleveland, dismisses SSD as unnecessary. "Originally, solid-state storage was necessary for critical high-access data sets for online transaction-processing systems," he says. "The response time provided by traditional direct-access storage devices [DASD] created performance bottlenecks for these applications. In the last five years, the performance increases in traditional DASD with large cache sizes has mostly eliminated the need for solid-state storage."

Gerr doubts that the technology will move into the mainstream anytime soon. "It just doesn't have the economic fundamentals," he says. But SSD appliances have their place in the data center, particularly for transaction-intensive applications where random data-access patterns make the system "cache-unfriendly," he says. "If you have that demanding of an application, and traditional storage solutions haven't provided the performance you need, then you might try [SSD]," Gerr says. 41310

Closing the Price Gap:
Solid-state disk vs. hard disk drive costs

YEAR	COST PER MB	
	HDD	SSD
1998	$0.36	$25.00
1999	$0.28	$18.00
2000	$0.21	$12.00
2001	$0.10	$7.00
2002	$0.05	$3.50
2003	$0.02*	$1.85

*Price reflects ATA disk pricing. For high-end storage arrays such as EMC Symmetrix or IBM Shark, price per MB ranges from $0.05 to $0.07.

SOURCE: ENTERPRISE STORAGE GROUP, MILFORD, MASS.

DONNA TEREK

Commodity clusters won't solve all supercomputing problems.

VINCENT F. SCARAFINO

Title: Manager of numerically intensive computing, Ford Motor Co.

Observation: Japan recently grabbed the supercomputer lead from the U.S. with its Earth Simulator for climate modeling. Operating at 36 trillion operations per second, it's the fastest supercomputer in the world.

Prediction: Without a resumption in federal support for supercomputer research and development, the U.S. will fall behind in many areas of science and engineering.

Several years ago, the federal government shifted its funding for high-performance computing from exotic architectures to clusters of commodity processors. The clusters are fine for some jobs, but not for the most demanding ones, says Ford supercomputer user **Vincent F. Scarafino.** *He explained to* Computerworld*'s Gary H. Anthes the potential consequences of the U.S. losing the supercomputer race to Japan.*

Why worry about U.S. leadership in supercomputing? Why can't Ford just buy supercomputers from Japan if that country makes the best machines? Advanced supercomputers enable breakthroughs in leading-edge science. Access to these leading-edge supercomputers has, through the years, provided Ford with a competitive advantage. If the U.S. loses leadership in this area, U.S. science and industry will lose early access to the fastest, most capable machines. The Japanese Earth Simulator has already shown this effect. Japanese interests are the primary ones being served. American scientists have limited access to the machine, but not at the same level as if it were an American resource available here.

The Earth Simulator is made up of NEC supercomputers that are a refinement over the last vector supercomputer we made here in the mid-1990s, the Cray T-90. Japanese auto companies are formidable competitors. We don't need to hand them yet another advantage.

What should the federal government do to boost U.S. supercomputing technology? Fund high-end processor design and supporting system components. The goal would be ultrafast processors with memory and I/O systems well matched to the computational speeds.

The government used to do just that, sponsoring development of high-end supercomputer architectures like the Cray vector machines. But now it seems to favor huge clusters of commodity microprocessors. Yes, in the mid-1990s they said that microprocessors were getting faster and faster, and we just need to put a whole bunch of them together and we've got a supercomputer. Well, it doesn't work quite that way. Microprocessors are fast at computing, but in order to run real difficult problems, they have to have real fast access to memory and be able to do I/O quickly. And memory subsystems are extremely expensive.

If you look at the very large machines made up of off-the-shelf components, they get about 5% of their theoretical peak performance. But if you look at the Earth Simulator, you see numbers from the high 30s to mid-50s.

FUTURE WATCH

Are there some applications for which the commodity-based clusters of microprocessors are a good approach? They provide extremely good price/performance for solving well-known problems whose computations can be evenly split among many independent processors.

What could Ford do with a supercomputer 1,000 times more powerful than it has today? Predict occupant injury in accident scenarios. Improve durability analysis through full-vehicle-lifetime simulation. Explore greater variance in design parameters, helping balance competing design requirements while reducing design cycle time.

Can't Ford do those things today? The occupant injury thing is an analysis to actually compute what kind of damage is done to human organs — the brain or liver, for example. Today's analyses with test dummies are very crude. They find at a gross level whether that kind of crash is survivable. But [occupant injury analysis] takes much more computing power than is available now.

What else would you like to be able to do? Try to understand how exotic materials would work, well enough to understand if they'd work in vehicles. These composite materials are very strong, but understanding how they would react in a failure mode is a difficult problem to solve with today's computers.

What will the next generation of supercomputers look like? The next generation of supercomputers will most likely be similar to the last generation of supercomputers built in the early to mid-1990s. But they will be significantly faster and able to execute difficult algorithms at speeds much closer to theoretical peak rates than commodity-based machines are able to do.

Will there be any breakthroughs in software over the next five years? There has been significant progress in the area of parallel processing during the last eight years. I would expect continued evolution. I am not aware of any specific areas that seem ripe for breakthroughs, but these things are difficult to predict. Software cannot substitute for raw processing speed.

Does the debate about supercomputer architectures for scientific computing have any relevance for commercial applications such as transaction-processing systems? If you look back to when supercomputers first came out and there was a real push in high-end machines, what was learned always ended up later in commercial computing. But there is no more engine pulling that; there isn't this trickle-down effect any more. **41365**

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Supercomputing Horizons

EXPANDING ROLES FOR Identity Management

As applications and users multiply, companies are turning to ID management software to improve access to applications, password management and the provisioning of resources.

By Jaikumar Vijayan

ALLEN CRAWFORD / PLANKTON ART

SOUTHWEST AIRLINES CO. has just implemented software that allows hundreds of its engineers and mechanics to access proprietary information from its aircraft supplier's systems, using a single Web sign-on.

By year's end, Lehman Brothers Holdings Inc. will have in place a technology for automatically creating, modifying and deleting user accounts across the company in a fraction of the time it takes to do the same task manually.

In August, Sharp Healthcare Inc. rolled out software for secure self-service password reset and password synchronization across its major IT systems.

Those are examples of the kinds of projects that companies are undertaking to streamline access to applications and reduce the costs associated with managing enterprise identity information.

And there are other impetuses for such projects, says Deepak Taneja, chief technology officer at Netegrity Inc., a Waltham, Mass.-based vendor of ID management products. "In some cases, the business driver is cutting costs. In some cases, it is enhancing revenue. In others, it may be managing risk and regulatory compliance," Taneja says.

Identity management efforts focus on controlled access to information for employees, customers or business partners. Most ID management projects fall into one of three categories: Web access control, user account provisioning or password management.

- **Web access control** efforts typically deal with managing identities to authenticate and authorize users to multiple Web applications using a single sign-on. The growth in e-commerce, business-to-business and Web services initiatives has driven companies to provide secure access to Web applications for business partners, customers and employees.
- **User provisioning** initiatives, meanwhile, deal with the manner in which identity information is used to create or revoke individual user accounts on an enterprise network. Account-provisioning tools allow companies to accomplish both tasks far more quickly, securely and cheaply than manual processes allow.
- **Password management** efforts are spurred largely by the need for companies to lower some of the administrative costs associated with managing identities. They enable self-service password management and synchronization, delegated administration of passwords and enforcement of consistent password policies for multiple applications.

User and App Explosion

"There has been a significant increase in the number of users accessing applications and network resources," leading to demand for ID management technologies, says John Worral, a vice president at RSA Security Inc. in Bedford, Mass.

The growth of e-commerce and business-to-business applications and the trend toward Web services have

KNOWING WHO YOU ARE

One of the fundamental requirements to successfully rolling out an identity management project is to have an authoritative source for identity information, users say.

"If you have no concept of who your employees are or where your core ID information is coming from, all you are doing is amplifying noise," says Brian Buege, manager of application frameworks at Southwest Airlines.

The sheer diversity of systems in an enterprise network – each with its own user profiles – has resulted in identity stores popping up everywhere. To have a good ID management process, it's vital to have one version of the truth when it comes to user identities, says Giuseppe Cimmino, director of corporate technology at Discovery Communications.

Discovery decided to use its main human resources database system as its authoritative source when it recently implemented a Web access management technology from Netegrity.

Human resources records offer the most accurate and up-to-date information on a user's status within the company and are therefore the best identity source, says Ramin Safai, associate vice president of information security at Lehman Brothers.

Lehman is in the midst of a major account-provisioning project in which it's populating its core user directory with information directly from the human resources system.

"You need an HR identity to get into our systems. No one gets in without it," Safai says.

Another big issue, especially when it comes to account provisioning, is role definition, says Don Richman, manager of authentication and directory services at Raymond James Financial Services.

Since provisioning systems create user accounts based on their roles within a company, it's vital to specify the right level of access for each role, Richman says. That can be an enormous task involving input from multiple groups, especially in large organizations. he says.

– Jaikumar Vijayan

opened up enterprise applications to a wider range of internal and external users than ever before, says Giuseppe Cimmino, director of corporate technology at Discovery Communications Inc. in New York.

Consequently, there is a need for tools that can help companies centrally track and manage user identities, Worral says.

For Southwest, the payoff comes from increased productivity and reduced administrative costs, says Brian Buege, manager of application frameworks at the Phoenix-based airline.

The company uses NetPoint from Cupertino, Calif.-based Oblix Inc. to enable single sign-on access to multiple Web applications.

Oblix's technology has allowed Southwest to create a central identity profile for each employee that's used to authenticate and authorize access to Web applications.

NetPoint's support for the Security Assertion Markup Language (SAML) has also allowed Southwest to establish a more efficient process for logging on maintenance staff and engineers to supplier The Boeing Co.'s extranet. NetPoint allows Southwest to exchange SAML security assertions with Boeing that vouch for the identity of its employees, so they can be automatically logged into Boeing's applications. Previously, Southwest's engineers had to log in and authenticate themselves separately on the Boeing site.

"We pride ourselves on being a low-cost airline. We can't afford any additional cost when it comes to maintaining infrastructure," Buege says.

Web access-control products also allow companies to apply shared security measures for accessing multiple Web servers and applications, says Don Richman, manager of authentication and directory services at Raymond James Financial Services Inc. in St. Petersburg, Fla.

The approach is more efficient than having separate identity stores and access policies associated with each application, Buege says.

Raymond James is implementing centralized, policy-based access to Web applications using RSA's ClearTrust Web access software.

ClearTrust allows Raymond James to centrally control, manage and audit functions such as user access entitlements and authentication policies. It also enables Raymond James to delegate certain administrative tasks, such as password management, to business units as needed.

"What it allows us to do is centralize common rules and system-access policies in one location rather than have applications with their own application-level security and access," Richman says.

GLOSSARY

Commonly used terms in identity management:

- **Web access management:** The use of identity information to authenticate users and authorize access to multiple Web applications
- **Account provisioning:** The use of identity information to automate the creation of new user accounts or revoke account access across the enterprise
- **Password management:** Refers to self-service password resets, password synchronization and delegated user administration
- **Directory:** A repository of user-identity information
- **Single sign-on:** The process through which a user is authenticated once in order to access multiple applications

New Access and Orphans

User provisioning projects deal with issues such as how quickly a new employee gets access to appropriate enterprise applications and services, or how to eliminate orphaned accounts.

Both are crucial issues, especially in large companies, says Pete Lindstrom, an analyst at Spire Security LLC in Malvern, Pa. It's not unusual in large companies for new employees to wait several weeks to get access to all the enterprise applications and resources that they need to do their jobs, says David Lavenda, a vice president at Business Layers Inc., a vendor of account-provisioning products in Rochelle Park, N.J.

What's even more common is the existence of orphaned accounts that remain on systems long after an employee has left a company, says Lindstrom.

It was the security risks posed by such orphaned accounts that drove Lehman's implementation of a third-party account-provisioning technology, says Ramin Safai, the New York-based company's associate vice president of information security. "For regulatory and other [security] audit-based requirements, we needed to have something to answer the question of who has access to what system," Safai says.

So Lehman is deploying a third-party tool that uses employee records from the company's main human resources database to create or delete user accounts. Safai says company policy doesn't allow him to disclose the technology that Lehman is using to implement the capability.

When a new user is entered into Lehman's human resources system, its third-party provisioning software immediately assigns the appropriate network and system access based on company policies and that person's role in the organization. Any changes to that user's status within Lehman — such as a promotion — trigger immediate changes in access levels.

Similarly, when an employee leaves Lehman, the provisioning software immediately disables access and checks back periodically to ensure that access remains disabled.

"What used to take a week can be done in a few minutes" with the provisioning technology, Safai says.

The benefits that can be derived from such automation also drive password management efforts, Lindstrom says.

Sharp Healthcare, for instance, has used Boston-based Courion Corp.'s PasswordCourier product to enable users to manage their own passwords, says CIO William Spooner.

PasswordCourier has also enabled San Diego-based Sharp to enforce stricter rules relating to the creation and management of passwords, Spooner says.

The return on investment comes from the "fewer calls for password resets to the corporate help desk and much simpler [password] support requirements," Spooner says.

There are challenges to deploying such technologies that shouldn't be overlooked, users say. A lot of them have to do with having reliable sources for identity information. Since ID management tools automate manual processes, it's also crucial to have good policies for managing identities in the first place, users say.

It's also important to choose technologies that can work in multivendor environments, says Southwest's Buege. No product offers all of the functionality required by companies to manage identities and control access to applications. **41411**

MORE RESOURCES

For a comprehensive listing of vendors that sell products for identity management, go to our Web site:

QuickLink 41558
www.computerworld.com

Layered Defense Falls to Worm Attack

The latest worm outpaces patching efforts, exposing personal firewall and antivirus weaknesses. By Vince Tuesday

SECURITY MANAGER'S JOURNAL

WE WERE PUSHING for a speedy move to the supposedly more secure Windows Server 2003 — until we ran into the vulnerability in remote procedure call (RPC) services that use the Distributed Component Object Model. Every version of Windows, including Server 2003, is vulnerable to this latest buffer-overflow flaw. So we're rethinking our plans.

Microsoft's announcement and patch were swiftly followed by the release of exploit code, so my team and I knew a worm was sure to follow. The patch involved a reboot, which increased the amount of change control needed for rollout. We did pretty well anyway: We had over 80% of our vulnerable machines patched by early August, when the Blaster worm, which exploits the RPC flaw, hit.

Luckily, even the most trivial of firewalls stops this worm. But there are enough Windows machines without firewalls out there that the worm infected much of the Internet. Our firewall was jammed with thousands of attempts to get in, but we were unaffected — at first.

We knew that even a good firewall isn't enough to stop a worm, so we began to analyze other routes such an infection might take. We quickly determined that our highest risk lay with laptop users.

We sent an e-mail to all laptop users and warned them not to connect to the corporate network without checking with the security team first. We also got an updated virus definition from our security software vendor, Santa Clara, Calif.-based Network Associates Inc., and began rolling that out. Fortunately, McAfee VirusScan doesn't require a system reboot on most installs. We could roll it out with minimal disruption and plan a more convenient time to install the Microsoft patch.

Our laptop users heeded our warning, and soon we were checking laptop firewall configurations and antivirus software signatures.

At this point, we felt proud of ourselves. We started thinking how foolish a big company like ours would be to allow itself to be hit by the Blaster worm. An easy patch, plenty of warning and a poorly written worm that could be blocked by the simplest of firewalls. How could you fail to stop it?

A few days later, we had our answer, as desktop after desktop lit up with virus-alert warnings for the Blaster worm and our intrusion-detection systems (IDS) went wild. Someone on the inside was spreading the worm.

> **Desktop after desktop lit up with virus-alert warnings. . . . Someone on the inside was spreading the worm.**

We used our IDS to quickly isolate the source of the problem to one laptop user. While my colleagues frantically called the user to tell him to disconnect from the network, I literally ran down to his office. I was flushed, angry and out of breath from running across the building. I didn't bother with our normal incident process: Once I confirmed that I had the right machine, I confiscated the laptop without explanation and left. I felt so betrayed by the user that I didn't know what I'd say if I remained in his office.

Once I got back to my group, we had a few nervous, quiet moments monitoring the IDS. Fortunately, it had returned to green status with the removal of the laptop. A few more antivirus alarms came through, but these turned out to be delayed warnings.

We had caught the problem in time. No other machines had been infected, although we came frighteningly close to a meltdown.

We'd been protected by the antivirus software on machines that didn't have the patch, and luckily the infected laptop hadn't tried to contact any machines that lacked the patch or didn't have an up-to-date antivirius signature.

We then analyzed the infected laptop. The antivirus signature was months old, and the firewall had been set to a wide-open, trusting configuration that had allowed the worm to break in.

After I controlled my temper, I returned to discuss things with the end user. He couldn't explain how the firewall had been changed, but he did admit that he had wanted to copy some files off his laptop before he gave us the machine to be checked, so he had ignored our advice and connected it directly to the network before letting us check it. This had allowed the worm to start scanning internally.

I'll have to put more effort into convincing laptop users to trust us, and I'll have to find ways to enforce the behaviors that we want. But it's clear that our pride in our defenses was misplaced. We need to patch quickly and have up-to-date antivirus software on every device in order to stand any chance of surviving the coming waves of worms.

Spam Redux

My company's "return to sender" strategy for coping with spam [QuickLink 40760] elicited a strong response from many readers. Perhaps the biggest concern: Some spammers use "from:" addresses on spam that actually belong to innocent e-mail users. By responding to these spoofed return addresses, some readers argue, I'm contributing to the problem.

In fact, we don't reply to every message. Our system is designed so that each return address receives only a single copy of our warning and authentication request, so as not to flood recipients with responses. We also include the full headers of the spam we've received so that a recipient of our response can investigate when someone has spoofed his address. Subsequent e-mails from that address are discarded.

It's not a perfect strategy, but it's working, and we've received no complaints thus far. If anyone can suggest a better alternative that ensures no loss of critical e-mail, protects our users from having to see offensive spam and costs less than $100,000 a year, I welcome your ideas.

WHAT DO YOU THINK?

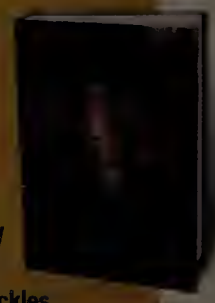
This week's journal is written by a real security manager, "Vince Tuesday," whose name and employer have been disguised for obvious reasons. Contact him at vince.tuesday@hushmail.com, or join the discussion in our forum. **QuickLink a1590**

To find a complete archive of our Security Manager's Journals, go online to **computerworld.com/secjournal**

SECURITY LOG

Security Bookshelf

***Beyond Fear*, by Bruce Schneier, Copernicus Books, 2003.**



Schneier is a world-renowned cryptography expert who literally wrote the book on the subject when he penned *Applied Cryptography*. In these pages, he tackles broader security issues in the wake of the 9/11 attacks.

***Beyond Fear* is intriguing and thought-provoking. Taking examples from the headlines and from his experiences studying homeland security issues, Schneier teaches us to avoid fear and use good sense when making security choices. He cites interesting facts to help readers keep things in perspective. For example, he reports that while many people may worry about shark attacks, more people die each year in pig attacks than shark attacks.**

Schneier helps readers draw their own conclusions about which post-9/11 changes made the public more secure and which were aimed at making us *feel* more secure. The book's value lies in his ability to get readers to look at security problems from a different angle.

– Vince Tuesday

TruSecure Adds Risk Management

TruSecure Corp. has announced a new enterprise security management application. Risk Commander is a risk management tool that pulls and analyzes data from other security products, such as scanners, firewalls and network management tools, in order to spot relationships between seemingly disconnected security events.

Risk Commander will be available in November. Prices will start at $150,000 for an enterprise license, according to Herndon, Va.-based TruSecure.

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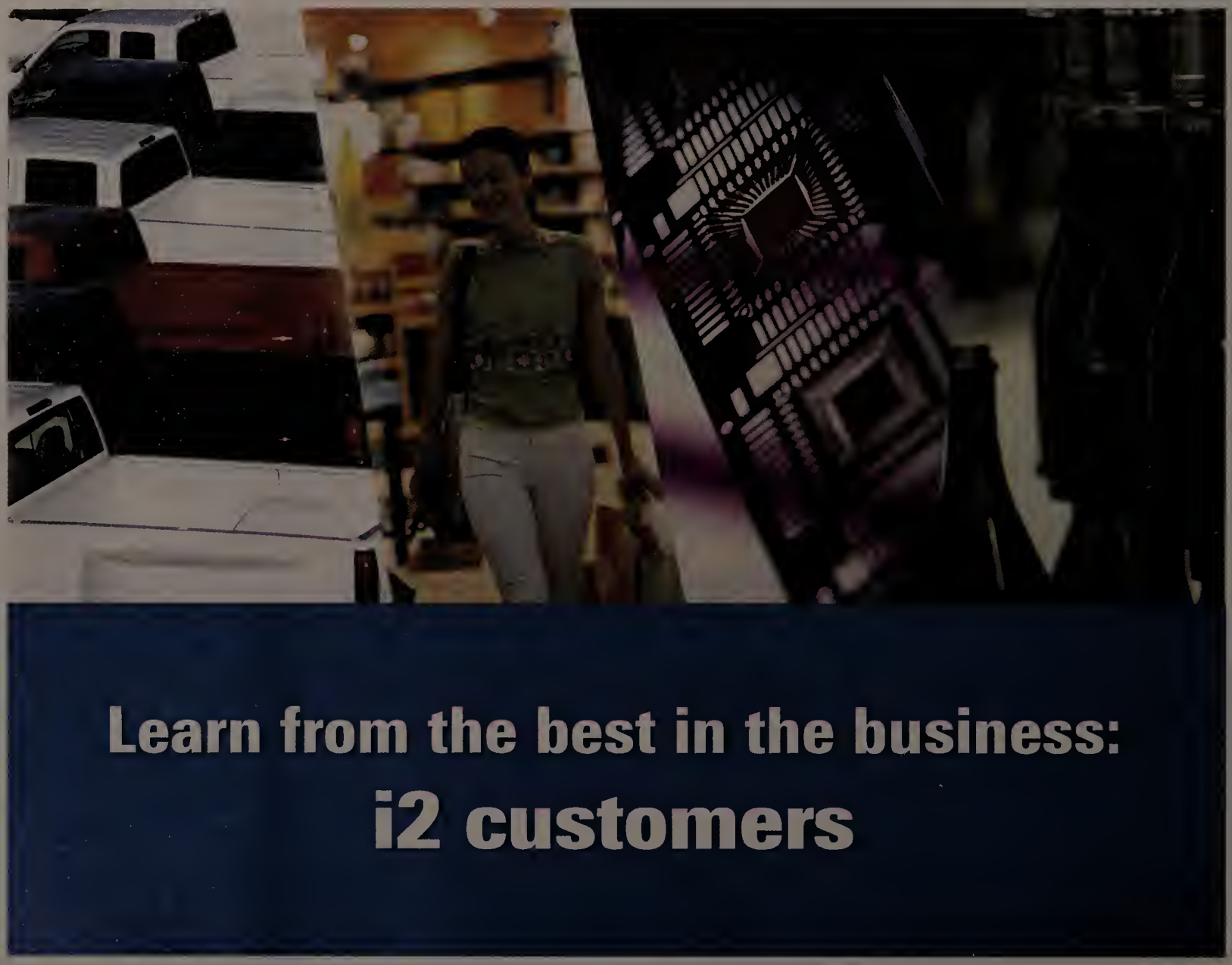
BRIEFS

ADIC Launches Backup Product

Advanced Digital Information Corp. in Redmond, Wash., last week announced the ADIC Pathlight VX integrated disk-to-tape backup product, which uses serial Advanced Technology Attachment disk arrays to speed backup and restoration of data. The Pathlight VX comes with up to 40TB of RAID 5 protected capacity and total throughput of up to 1TB per hour using 2Gbit/sec. Fibre Channel connectivity. The system will ship in the fourth quarter. Pricing starts at $190,000 for a 10TB system.

Antispam Service Targets Verticals

Postini Inc. has announced Postini Perimeter Manager Enterprise Edition, which is designed to tackle corporate e-mail problems related to security, spam, viruses and prohibited content. According to Redwood City, Calif.-based Postini, the new software can be tailored to control spam in specific vertical industries, including financial services, professional services, law and pharmaceuticals. It uses heuristics at the SMTP content and transport layers to allow businesses to configure it to their specific needs, says Postini. The new application will be available in early October and will be priced starting at $15 to $25 per seat, based on the number of users.



Lycoris Releases v3 Of Desktop/LX

The latest versions of Lycoris Inc.'s Desktop/LX Linux-based operating systems are now available. New features include improved tutorials, hundreds of updated drivers, crisper font handling, increased support for Hewlett-Packard Co. printers and autoconfiguration of Wi-Fi connections, according to the Redmond, Wash.-based company. The software is available in three versions, including the enterprise-level Lycoris Desktop/LX Inter-Connect Update 3 version. The $229 package includes the operating system and an office suite featuring a word processor, address book, calendaring application, spreadsheet software and a presentation application.

Corex Offers Outlook Contact Updates

Business card scanner vendor Corex Technologies Corp. now offers an automatic, Web-based business-contact update service. Available on a subscription basis for users of Microsoft Outlook 2000 or 2002, the AccuCard for Outlook 1.0 service automatically sends an e-mail to the user's contacts once each quarter to ask them to update information in the database. Annual subscriptions for the stand-alone updating service cost $49.95. The Cambridge, Mass.-based company includes its $249 Corex CardScan business card scanner free of charge as part of the subscription package.

BRIEFS

APC Introduces Portable AC Unit

West Kingston, R.I.-based American Power Conversion Corp. (APC) last week introduced a portable air conditioner that's designed for small data centers and IT equipment closets. The PA4000, which provides up to 4 kilowatts of air conditioning, utilizes dual ducts to bring in air from the outside and remove hot air from equipment areas. The system includes programmable set points and on/off scheduling. It is priced at $3,499.

Schneider Tool Aids Shipment Search

Schneider Brokerage, a division of Schneider National Inc. in Green Bay, Wis., has launched FreightPlace, a tool designed to aid carriers in finding shipments to match their capacity. FreightPlace enables carriers to anonymously search for and find loads to fill their excess available capacity, the company said. Carriers can view potential loads for their capacity in real time and connect with one of Schneider's freight brokers via online chat or telephone to obtain more information about loads and to negotiate pricing, according to Schneider.

GE Picks Plateau E-learning System

In what may be one of the largest electronic learning implementations of its kind, General Electric Co. has begun installing an e-learning management system from Arlington, Va.-based Plateau Systems Ltd. Plateau 4 LMS will serve as the core e-learning management system at GE, replacing a number of divisional systems. The system is expected to help GE provide virtual desktop training to more than 300,000 employees and contractors on five continents. The business-by-business implementation of the software is expected to be completed by the end of the first quarter of 2004.

TOMMY PETERSON

Who Am I This Time?

MY DAY AT THE OFFICE starts when I switch on my laptop and, responding to the system prompt, type the name of my Icelandic great-grandfather into the password field. As soon as Windows XP stops churning, I click on Lotus Notes and watch the hieroglyphics dance beside another password box as I type in the name of my favorite basketball coach. Having proved who I am to the satisfaction of our relatively low-security system, I can then get down to work.

TOMMY PETERSON is *Computerworld*'s technology editor. Contact her at **tommy_peterson@computerworld.com.**

This description confirms that I'm among the vast majority of computer users who sentimentally drop little crumbs of their real identities into the markers that enable their virtual identities. Of course, these bits of individual history also serve as effective mnemonic devices, which are pretty hard to come by when your password is something like "8bz96q."

Those two passwords are about all I need to do my job, but they're just the beginning of my own personal identity management crisis. Add to those the usernames and passwords necessary to track my bank and credit card accounts, retirement funds and escalating fines at the public library. And then there are all those useful Web sites with the irritating requirement that I register before they'll give me access to the content, even if it's free. I'd use the same username and password every time if only I could remember them without introducing ever-so-slight variations.

But any individual's minicrisis dwarfs in comparison to the identity management problems facing most large businesses. The typical Fortune 500 company reports that it maintains over 180 directories, often requiring end users to keep track of a dozen or more sets of IDs and passwords, according to the Burton Group. This situation represents a security and help desk nightmare. There's plenty of software being developed to solve the problem (see story, page 34), but the complex issue of identity management remains far from resolution.

In the corporate context, identity establishes a relationship between a person (or entity) and a business process. That relationship evolves over time, has a life cycle and, at some point, should come to a clear end. The relationship also almost always involves a push-pull between the availability of information and security concerns.

For a business, managing identity means providing and controlling access to key applications and information. It means being able to turn that access on and off easily and protecting information on both sides of the relationship.

E-commerce has been the showcase for many high-profile identity management issues. And, those haven't gone away — if anything, the struggle between privacy and convenience has been intensified by increasing regulatory pressures. But much of the action on the identity and access-control front has moved inside the corporation to employees — and to the boundary of the organization where relationships are maintained with partners and suppliers.

When a new hire joins the company, he is assigned an identity, probably an e-mail address and a password, which will be enlarged to include his privileges to access the computer system, network file shares and applications appropriate to his specified role. Some of those applications will come with new identifiers and authentication mechanisms. Clearly defined roles and policies are at the heart of automated identity management within the corporation.

A promotion or transfer automatically translates into access to different resources. Identity management systems track the roles that match the employee's changing position in the company, sometimes adding privileges and enlarging his identity, and at other times pruning outdated access or services. The process continues until the employee leaves or retires, at which time the final step in the process is to end all access tied to the user's identities and authentications, lest the vestiges of his identities create the security risk of an "orphan" account.

The increasing need for companies to offer partners, suppliers and contractors access to their systems dramatically ratchets up the scale and complexity of the identity management problem. The exchange of information has become a core business transaction that can take place only when everyone's identity is established and authenticated while intellectual property rights and the privacy of individuals are maintained.

Identities, in a business context, will be increasingly consolidated and standardized as they're federated across many organizations. And the means of authentication will change. As ID management systems expand, security risks grow. Password references to pets, former significant others, alma maters and other arcane personal tidbits will be replaced by an encrypted key, a token or a fingerprint scan.

What could be more personal than a fingerprint? And there's nothing to remember. **41603**

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Dear Reader,

September 29,2003

Duane Zitzner
Executive
Vice President,
HP Personal
Systems Group
Hewlett-Packard
Company

Please join me in congratulating the winners of the 2003 Computerworld Best Practices in Mobile & Wireless Awards Program. They have distinguished themselves as leaders in their field, and by sharing their success stories, they continue to motivate other IT managers to strive to find similar winning solutions. HP is proud to be sponsoring this prestigious awards program.

I would also like to acknowledge and thank the many companies, public relations firms, agencies, other organizations and individuals who took the time to respond to the nomination submission process. Narrowing the field down to 100 finalists was a difficult challenge.

Additionally, HP would like to extend its thanks to the judges who had the arduous task of selecting two winners in each of five categories and honorable mention designates. HP and Computerworld are most appreciative of your dedication to this program.

I hope that the profiles of the ten winners in this supplement will help you identify the challenges you face and enable you to derive benefits from the deployment of mobile and wireless technology. These exciting and innovative technologies are creating avenues to meet business, administrative and customer service challenges.

Once again, congratulations to the winners of this program and good luck in your future IT solution endeavors.

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University Health Network

Honorable Mention: UPS

Supplement compiled by Brian Sullivan, Computerworld Custom Publishing contributing editor. Judging criteria and other program information is available online at www.mwwusa.com.

Mobile & Wireless World Conference: May 24-27, 2004

Systems Implementation

Company Overview

U.S. Army's Program Management Office — Combat Systems

PM Combat Systems,
Systems Engineering Division,
System Integration Branch
Attn: SFAE-GCS-CS-S
MS 506
6501 East, 11 Mile
Bldg. 229, 4th Floor
Warren, MI 48397-5000

URL:

www.peogcs.army.mil/about.cfm

Established:

1965

Number of Employees:

150

Business Profile:

The group is charged with enhancing the capabilities of armored combat crews without adding to their burden. With a budget of over $500,000, the group must deliver a reliable and workable solution in extremely harsh conditions.

Deployment History:

The Abrams M1A2 SEP and Bradley M2A3 were used as the proof-of-principle technology for integrated platforms that will be used to feed into other efforts such as the Interim Armored Vehicle Program, the Future Combat System and the Objective Warrior Program.

Abrams Team
Project Champions

The U.S. Army's Program Management Office — Combat Systems

The Program Management Office — Combat Systems takes a total army perspective in managing the development, acquisition, testing, systems integration, product improvement and fielding of the Abrams Tank Systems and Bradley Fighting Vehicles. Its task is to provide world-class equipment to the armored soldier, permitting him to achieve decisive victory.

Challenges

The goal was to give armored fighting commanders the ability to command from either inside or outside the vehicle without ever breaking visual contact with the enemy or adding to the burden of the crew.

Since digital Situational Awareness became available for armored fighting vehicle crews, those crews have been asking for ways to improve battle command on the move and command-and-control capabilities while in action. Currently, armored commanders must get down inside the vehicle and thus lose their overall view of the outside combat picture.

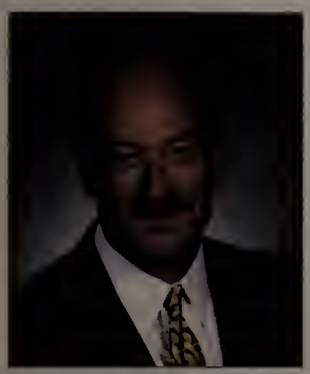
Solution

The Objective Integrated Combat, Command and Control (IC3) program implemented by the PM Combat Systems group allows commanders to receive battlefield data through a secure wireless LAN and interact with that data without ever losing sight of the enemy.

Benefits

Commanders can receive crucial data on a helmet-mounted display, which means they never have to lose the enemy visually. The commander can also interact with that data via a tactical voice-activated system, which allows the commander to communicate with other units, including fire missions, medical evacuation and supporting arms liaison teams. The program reduces the armored crews' burden, improves the soldier-machine interface and can be used whether the commander is tethered to the vehicle or not. All in all, the program offers armored crews a tactical edge in combat.

Recognizes the successful design, implementation and management of an interoperable mobile and wireless architecture. Demonstrates the ability to source/implement from multiple vendors and to maintain a heterogeneous environment.



Kurt Zimmer
Project Champion

Putnam Investments

Putnam Investments is a global money management firm with 65 years of investment experience, $271 billion in assets under management, over 700 institutional clients, and nearly 13 million shareholders and retirement plan participants.

Challenges

The IT organization must support a mobile workforce of wholesalers who spend up to 80% of their time on the road and have limited access to computer networks and enterprise applications. These wholesalers are critical in helping Putnam differentiate its products from those of its competitors and in ensuring that financial advisors recommend Putnam's mutual funds. Putnam targeted three key areas to meet its goals:

- Ensure that wholesalers knew their advisors well and were able to improve service to them.
- Reduce the administrative load on inside sales representatives.
- Provide better management control of the sales process.

Solution

Putnam chose a mixture of products from several different vendors for devices and device management software. The hybrid solution allowed Putnam's staff to access the company's email and CRM and sales programs. Putnam's sales force is now able to manage contact, sales data and reports; track account activity; and address other key business functions in a two-way data exchange with Putnam's enterprise systems.

Benefits

Wholesalers have logged more than 60,000 contract activities through their PDAs since the program was rolled out late last year. User adoption is over 90% in an audience that was traditionally tough on new technology. Sales management noted several key benefits, including improved wholesaler efficiency, fewer calls to inside sales and more consistent tracking of field sales activity.

Future activities include upgrading the entire process with the latest vendor offerings and rolling the program out to the international sales team.

Company Overview

Putnam Investments
One Post Office Square
Boston, MA 02109

URL:
www.putnam.com

Established:
1938

Business Profile:
Putnam Investments is a global money management firm with $271 billion in assets under management, over 700 institutional clients, and nearly 13 million shareholders and retirement plan participants. It offers a broad range of investment products including institutional portfolios; 401(k)s, IRAs and other retirement plans; mutual funds; variable annuities; and alternative investments for institutions and high-net-worth investors.

Deployment History:
The project began with a production pilot rollout to 12 wholesalers, serving as a test group to gauge the interest of the sales team and usefulness of the technology. The pilot went live in 10 weeks and was met with strong positive feedback. The rollout continued to the full sales team in December.

PUTNAM
INVESTMENTS

Systems Reliability

Company Overview

Guidant Corp.
111 Monument Circle, #2900
Indianapolis, IN 46204

URL:
www.guidant.com

Established:
1994

Number of Employees:
12,000

Business Profile:
Guidant develops, manufactures and distributes medical technologies to treat cardiovascular and vascular disease. Its therapies save and improve the lives of thousands of patients around the world every day. Guidant was incorporated in 1994, and since has grown to $3.2 billion in revenue and more than 12,000 employees worldwide.

Deployment History:
Guidant transformed its terms of competition in the industry and enhanced its ability to serve its clients. Guidant plans to expand the Implant Registration, Inventory and Sales system to a total of 1,500 mobile users over the next two years and add up to eight more applications.

GUIDANT

Guidant Corp. Team Project Champions

Guidant Corp.

Guidant is a world leader in the design and development of cardiovascular medical products. Guidant's technologies help patients with heart disease return to active and productive lives. The company's headquarters are in Indianapolis, with major operations in California, Minnesota, Texas, Washington, Puerto Rico and Ireland. Guidant's products are distributed by a sales force recognized throughout the industry for its clinical expertise and customer service.

Challenges

Guidant's Cardiac Rhythm Management group develops devices that correct life-threatening rapid or irregular heartbeats. Guidant has more than 1,300 representatives on site in the operating room to provide technical assistance related to the device. Guidant needed a way to enhance the ability of this team to do its job.

Solution

Guidant's sales force automation team equipped these field representatives with laptops running a collection of the most up-to-date applications. Access to the Guidant network was through dial-up, Wi-Fi or broadband connections with dual-factor authentication. The Implant Registration, Inventory and Sales (IRIS) system was the next major tool to be added to the Guidant sales force toolbox. The file replication subsystem is the backbone of the IRIS system and other software tools in the future. IRIS distributes the data field representatives need to do their jobs efficiently and effectively, and allows headquarters to capture data about implants and sales from the field reps.

Benefits

The new system guards against bandwidth creep and keeps the length of synchronization sessions to a minimum. It also offers a single, integrated console. This allows the IT staff to configure data-sharing logic, start and restart servers, view detailed system logs and manage the user community.

Acknowledges implementation strategies and programs to ensure highly available information and data access. Examples of business continuance initiatives (backup plans, staging, performance testing/projections, etc.) were key considerations.

Ron Neher
Project Champion

Motorola Inc.

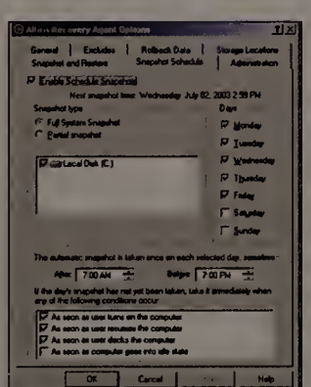
Founded in 1928, Motorola has gone on to become a worldwide force in the wireless, broadband and Internet industries. The company has become known for its software-enhanced wireless telephone and messaging; two-way radio products and systems; and networking and Internet-access products. In addition, Motorola is a recognized maker of integrated electronics systems for the automotive, industrial and portable energy markets.

Challenges

Eighty percent of Motorola's PCs are laptops. Its PCs are connected to local-area, wide-area and enterprise networks, some with very low bandwidth. Previous backup systems that relied on human intervention were prone to error and eventual data loss. Motorola needed a PC backup-and-recovery software solution for a highly mobile and diverse computing environment.

Solution

Motorola turned to a commercially available recovery solution that was recommended by one of its employees, Ron Neher. The product allows for even the backup of live data on a regular basis without human intervention, and it only records the data that changed since the last backup, so bandwidth is never a problem. In fact, CPU utilization during a backup is as low as 10% to 20%. Employees no longer have to remember to perform backups, and they can recover any lost data with a simple right-click of their mouse.



Benefits

During the first backup, everything on a machine's hard drive is recorded. After that initial save, only the data that has changed is compressed and sent over the network for storage. This technology is an excellent fit for remote and mobile users on bandwidth-sensitive connections.

The company has 23,550 licensed users who have an average of 1.62 GB of unique data that needs to be backed up. Motorola conducted a before-and-after assessment of its PC data restore, recovery and replacement costs and found that it saved $6.04 million each year in labor costs. Right now, the company is in the process of expanding the program to cover all of its employees.

Company Overview

Motorola Inc.
1303 E. Algonquin Road
Schaumburg, IL 60196

URL:
www.motorola.com

Established:
1928

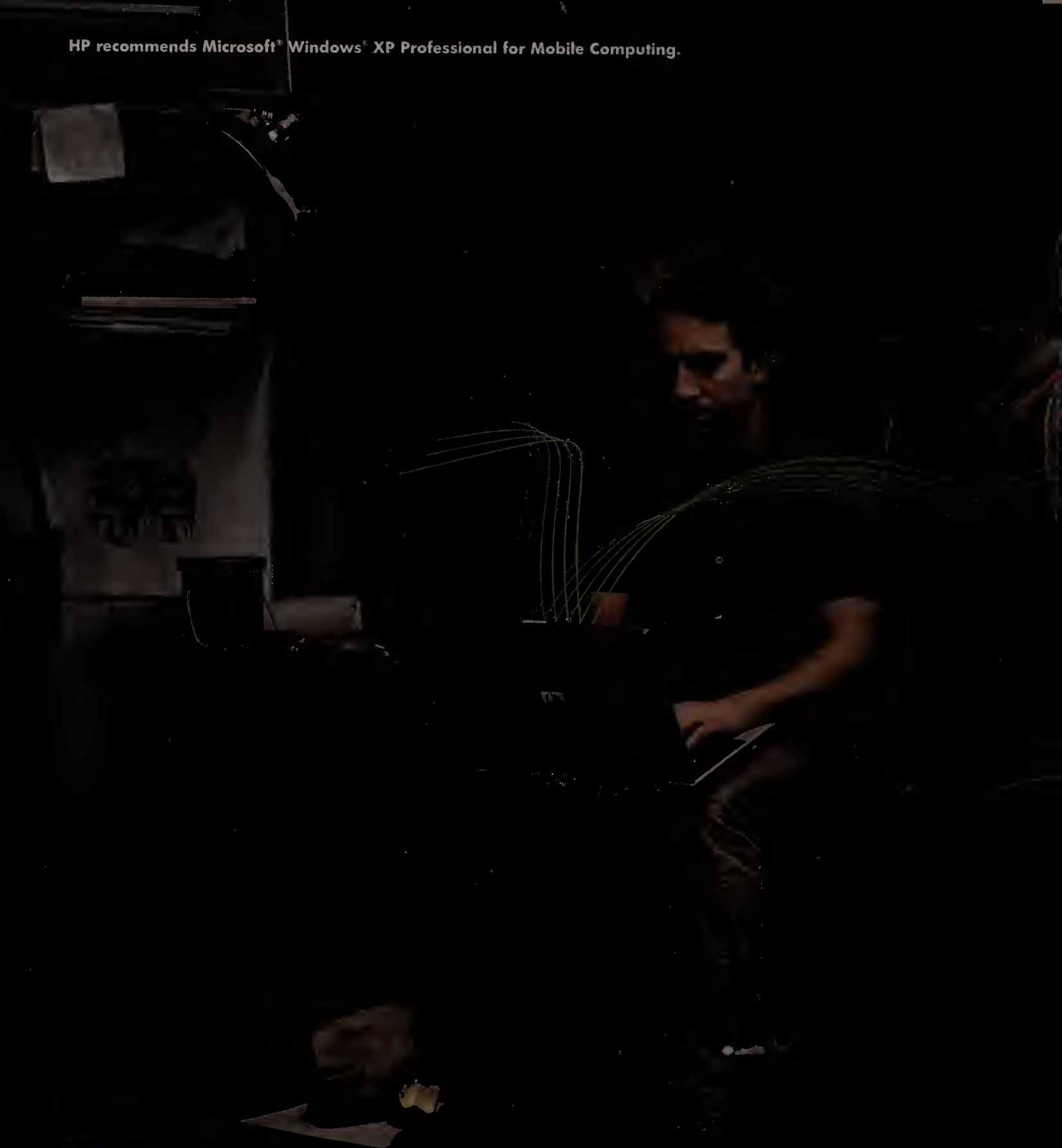
Number of Employees:
97,000

Business Profile:
Motorola Inc. is recognized in the wireless, automotive and broadband communications industries worldwide. Sales in 2002 were $27.3 billion. Motorola is a global corporate citizen dedicated to ethical business practices and pioneering important innovations that make things smarter and life better, honored traditions that began when the company was founded 75 years ago this year.

Deployment History:
Implementing the recovery solution for backup and recovery of enterprise PC data has helped Motorola save $6.04 million annually in reduced labor costs associated with PC backup and recovery.
Motorola's PC base consists of about 80% laptops. With the vulnerability of data in a highly mobile user base, an effective and efficient backup-and-recovery solution is mandatory.

MOTOROLA
intelligence everywhere

HP recommends Microsoft® Windows® XP Professional for Mobile Computing.



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Information Security

Company Overview

INTEGRIS Health Inc.
3300 N.W. Expressway
Oklahoma City, OK 73112

URL:
www.integris-health.com

Established:
1983

Number of Employees:
7,510

Business Profile:
INTEGRIS Health is Oklahoma's largest not-for-profit healthcare organization, operating 12 major facilities that support over 7,510 medical and administrative staff and 450 independent physicians. Named one of the 100 "most wired" health systems for four consecutive years, INTEGRIS has a continued commitment to quality healthcare.

Deployment History:
With an unidentified mix of hospital- and physician-owned mobile and wireless devices, the first priority was to silently monitor 5,000 workstations to detect synchronization and create an inventory of mobile users and devices with a security management software solution. Balancing usability and security has resulted in overwhelmingly positive feedback for the security solution.

INTEGRIS *Health*

William Woloszyn
Project Champion

INTEGRIS Health Inc.

INTEGRIS Health is Oklahoma's largest not-for-profit healthcare provider, operating 12 major facilities with more than 7,510 medical and administrative staff and 450 independent physicians.

Challenges

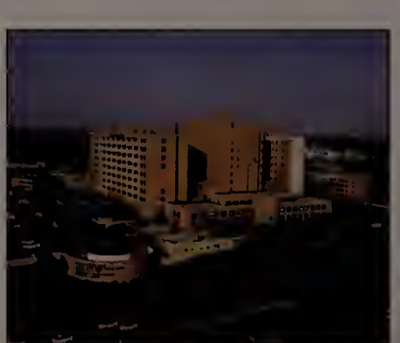
To provide higher quality patient care, INTEGRIS Health uses mobile and wireless technology to access patient records and lab results at the point of care. However, information resident on mobile devices is not protected by existing network security and poses new threats to the privacy of health information that is governed by Health Insurance Portability and Accountability Act (HIPAA) privacy rules. INTEGRIS Health needed a cost-effective security solution that would protect sensitive information from wrongful disclosure in the event the mobile device was misplaced or stolen.

Solution

INTEGRIS Health implemented a mobile security program using a commercially available security and management software product. This enables INTEGRIS Health to control security for mobile users across diverse computing platforms. Users are authenticated with a personal identification number (PIN) or password to protect information contained on the device. This also ensures data confidentiality and controls connectivity. In addition, information on the devices is automatically deleted if they are lost or stolen. Security functions are virtually transparent to the user and enable physicians to reset their own PIN or password.

Benefits

INTEGRIS Health can now minimize the burden of enforcing compliance to mobile and wireless security policies by centralizing policy administration and automating distribution processes. Administrators can control policy settings and device use based on existing group and user profiles. This eliminates the need to update multiple systems each time a change in employment status is made.



In addition, INTEGRIS Health now controls mobile device use and can prevent rogue devices from accessing networked resources.

A case study on the successful implementation of secure mobile and wireless computing/communicating and recovery from a significant network or systems disruption. Summary analysis of restart/recovery factors (backup deployment, time to restart and restore, information/data loss, etc.) was essential.

William S. Murray
Project Champion

Los Alamos National Laboratory

Los Alamos National Laboratory focuses on national security issues. In their effort to help the country counter nuclear proliferation — the possibility that someone may try to introduce a weapon to the U.S. and detonate it — LANL scientists have developed a hand-held nuclear isotope identifier that can not only identify the source of radiation, but also send data about it to experts who can provide further analysis.

Challenges

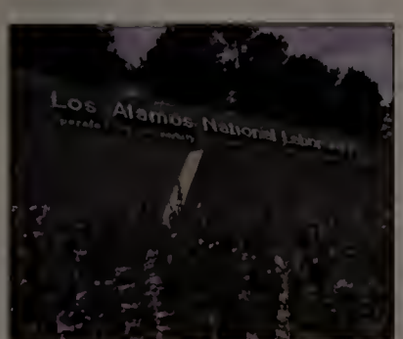
Border officials currently use large portal monitors that people walk through. These machines can generally tell if there's radiation present, but not what that radiation is. In many cases, people with cancer or other problems that require the use of medical isotopes set those detectors off. A device was needed to allow officials to tell right away if the radiation was from a legitimate device or a weapon of some kind.

Solution

LANL scientists developed a hand-held nuclear isotope identifier that can identify the source of radiation and send data about it to experts who can provide further analysis. The device consists of two parts. The first is based on a commercially available handheld that provides the user interface, communication device and data archiving. The second part is a radiation detector that has a microprocessor. The handheld slips into a cradle on the detector and communicates with the radiation detector's microprocessor.

Benefits

The handheld is a lot easier to carry around in the field and is easy to use. It also allows for flexibility in the future. In addition, the handheld makes it easy to transfer data to other machines, allowing a more detailed analysis by specialists. The use of a commercially available product also ensures that the lab will not be put into the position of trying to build its own upgrades to the handheld and its interface.



Company Overview

Los Alamos National Laboratory
Bikini Atoll Rd., SM 30
Los Alamos, NM 87545

URL:
www.lanl.gov

Established:
1943

Number of Employees:
11,359

Business Profile:
Los Alamos National Laboratory is operated by the University of California for the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy and works in partnership with NNSA's Sandia and Lawrence Livermore national laboratories to support NNSA in its mission.

Deployment History:
In 1997, Los Alamos started looking for ways to make radiation detection devices smaller and simpler to use for people with little technological experience. The events of Sept. 11, 2001, have made the need for this technology even more pressing.

Los Alamos
NATIONAL LABORATORY

Financial Payback

Company Overview

Burlington Northern Santa Fe Railway Co.
2650 Lou Menk Drive, 2nd Flr.
P.O. Box 961057
Fort Worth, TX 76161-0057

URL:
www.bnsf.com

Established:
1995

Number of Employees:
38,000

Business Profile:
The Burlington Northern Santa Fe Railway Co. operates one of the largest railroad networks in North America, with 33,000 route miles covering 28 states and two Canadian provinces. This network covers the western two-thirds of the U.S., stretching from major Pacific Northwest and Southern California ports to the Midwest, Southeast and Southwest, and from the Gulf of Mexico to Canada.

Deployment History:
Within two months of implementing its program, the BNSF realized a dramatic return on investment. The railroad determined that it reduced the usage cost per minute for wireless devices by 37% and has significantly driven down TCO.

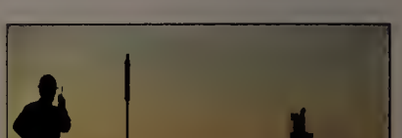
John Hicks
Project Champion

Burlington Northern Santa Fe Railway Co.

BNSF operates in 28 states and two Canadian provinces and moves freight over a rail network stretching 33,000 route miles, making it one of the largest railroads in North America. Wireless capabilities enable BNSF to improve service levels and generate efficiencies by keeping train crews, maintenance crews and management aware of current schedules and work plans.

Challenges

The majority of BNSF's employees uses wireless devices as their primary link to the office or dispatch center. But as dependency on wireless grew, the company faced rising costs. BNSF needed a comprehensive solution to address its wireless management challenges without dedicating additional internal resources. Challenges included accessing wireless usage information and associated costs across carriers, identifying savings opportunities and maximizing the return on investment (ROI) of wireless.

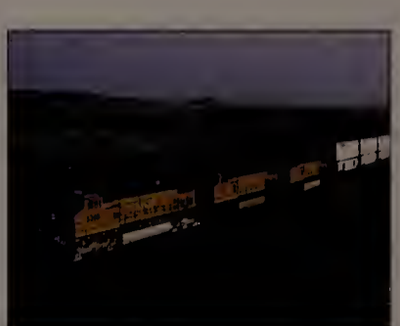


Solution

BNSF chose a leading mobile communications management software product to resolve the above issues and reduce wireless service costs while providing a robust solution for managers and employees to participate in managing wireless budgets. It provided BNSF with a customized, Web-based application suite and dedicated account support services to organize, analyze and optimize BNSF's wireless users, usage, devices, carriers and service costs, all within a single interface.

Benefits

The software dramatically reduces wireless service costs via a patented process for matching employees' monthly usage to the more than 14,000 available rate plans and continually drives down the usage cost per minute.



BNSF centralized wireless accounts and costs and delegated wireless management responsibilities to cost center managers and employees. BNSF realized positive ROI in two months and attained a total reduction in usage cost per minute of 37%. These results show that BNSF is getting the most out of each wireless dollar spent and aggressively driving down the total cost of ownership.

Achievements in measurable return on investment, return on assets and return on resources through the use of a mobile and wireless system were evaluated. Total cost of ownership benefits and other accomplishments were presented.

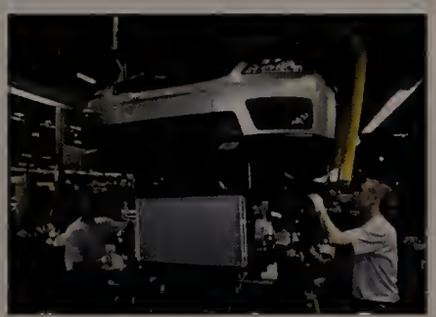
Mark Wrubel
Project Champion

Ford Motor Company

Ford Motor Company, headquartered in Dearborn, MI, is the world's second largest automaker, with approximately 335,000 employees in 200 markets on six continents. Its automotive brands include Aston Martin, Ford, Jaguar, Land Rover, Lincoln, Mazda, Mercury and Volvo. Its automotive-related services include Ford Credit, Quality Care and Hertz.

Challenges

The company's goals were to improve quality and reporting while increasing safety and cutting costs at more than 50 manufacturing plants through better tracking and delivery of parts inventory. Additionally, the entire system had to be easy to use, intuitive for assembly-line workers, and operable with wireless technology in a manufacturing environment.



Solution

Ford jointly developed a real-time locating system with Santa Clara, Calif.-based WhereNet Corp. The WhereCall Parts Replenishment solution provides real-time material replenishment requests for material handling utilizing radio-frequency call buttons. When an operator presses a WhereCall button, the system places a request for the associated parts. This information is transferred to material-handling operators, who deliver the material. In addition to notifying internal parts suppliers, the tag transmits information to Ford's management and results in better control of the supply chain.

Benefits

Ford has realized significant savings through lower installation costs, increased operation efficiency, lower inventory quantities and increased manufacturing flexibility. The wireless call system also costs half to three-fourths of what a similar system using wired components would cost. In addition, the system can be installed in a quarter of the time it took to install the previous systems, and line rebalancing operations can be done in much less time with virtually no additional capital expenditures for hardware and equipment.

The system ensures that materials are installed at their intended location.

Detailed data on material usage and delivery times are now available.

Company Overview

Ford Motor Company
One American Road
Dearborn, MI 48126

URL:
www.ford.com

Years in Service:
100

Number of Employees:
335,000

Business Profile:
Ford Motor Company is an international automaker that has multiple brands and competes for market share worldwide. The company needs to be able to manage many different parts streams to manufacturing plants worldwide while maintaining its competitive edge.

Deployment History:
The WhereCall system is in operation at more than 50 plants in North and South America and Europe, providing real-time material replenishment requests for material handling. Plans exist for the widespread deployment of additional solutions leveraging the multiple use infrastructures at most of Ford's North American and international plants within the next several years.

Innovation and Promise

Company Overview

London Ambulance Service

220 Waterloo Road
London, England SE1 8SD

URL:

www.londonambulance.nhs.uk

Established:

1965

Number of Employees:

3,700

Business Profile:

London Ambulance Service is the largest ambulance service in the world, caring for more than 1.5 million patients every year. As an integral part of the National Health Service, London Ambulance works very closely with hospitals and other healthcare professionals, as well as other emergency services.

Deployment History:

For London Ambulance, the decision to adopt GPRS as a solution was made at a time when GPRS was in its infancy. While a small element of risk was involved in adopting such a new technology, GPRS was identified as a better solution than other services, especially given how the various networks were expected to develop in the future.

Quentin Armitage
Project Champion

London Ambulance Service

London Ambulance Service is the largest ambulance service in the world, caring for more than 1.5 million patients every year.

Challenges

Serving an area of about 620 square miles, London Ambulance handles more than 1 million calls per year through 70 stations. A solution was needed that would enable London Ambulance to simultaneously switch between multiple wireless wide-area and wireless local-area network (WWAN and WLAN) connections. Previously used radio communications provided inefficient coverage for such an area, often slowing down critical response time.

Solution

Seamless network switching provides automatic switching between multiple WWAN and WLAN network connections. Now, when a London Ambulance vehicle leaves the 802.11b WLAN environment, its connection can switch to the general packet radio service (GPRS) and global system of mobile communication (GSM) networks as they become available, ensuring no break in communication. User-defined rules designate the order the networks should be tried until a connection is established.

Benefits

By switching from the WWAN to the WLAN and with the capability to switch from GPRS (packet data) to GSM (circuit-switched) networks based on availability, London Ambulance is able to minimize costs while maximizing coverage. Now, in the event of an emergency, ambulances are notified by the sound of a bell in the cab while detailed instructions appear simultaneously on their in-vehicle touch screen device. Following the initial notification, vehicles receive detailed driving directions via an in-vehicle navigation unit, which is attached to the touch screen PC. Meanwhile, the control room is receiving GPS navigation data back from the vehicle every 15 seconds. A map is also displayed, which enables the crew to see where the vehicle is in relation to their destination.

Successful pioneering of leading-edge mobile and wireless technology was recognized in this category. The ability to overcome early adoption obstacles and to resolve problems (in-house or via unique vendor/integrator/other user partnerships, etc.) was assessed.

Dr. Sydney Kennedy
Project Co-Champion

University Health Network

University Health Network is a consortium of three hospitals — Toronto General Hospital, Toronto Western Hospital and Princess Margaret Hospital — in Toronto. UHN is among the world's leading providers of exemplary patient care and innovative research and teaching.

Challenge

With increasing de-institutionalization of mentally ill patients, a cost-efficient way to treat those patients at the point of care (at levels consistent with those achieved in institutional settings) was required. In order to do this, psychiatrists, residents, clinicians and administrative staff need to be able to securely access, in real time, patient records, including such information as demographics, emergency visits, diagnoses, current medications, allergies, housing situation and clinical notes.

Solution

The first thing that had to happen was the digitization of all documents related to targeted patients. In addition, the establishment of a centralized administration management console that can overview and control operations was required.

Dr. Patricia Cavanagh
Project Co-Champion

The next phase, which began recently, was the integration of the back-end systems from the various institutions in the hospital's network. The technology is being facilitated with a transcoding technology that allows the program to take any business system and have it deployed with a single application programming interface onto any mobile and hardware platform intelligently and seamlessly.

Benefits

The labor force can be kept at static levels while increasing the quality and quantity of care delivered by removing the high cost of paper handling. Patient record management is labor-intensive, requiring field care workers to print data from various healthcare systems so that information will be available to them in the field. Healthcare professionals themselves can create a personalized, single view of a patient record that will improve collaboration.

Company Overview

University Health Network
250 College Street
Toronto, Ontario M5T 1R8
Canada

URL:
www.uhn.ca/uhn

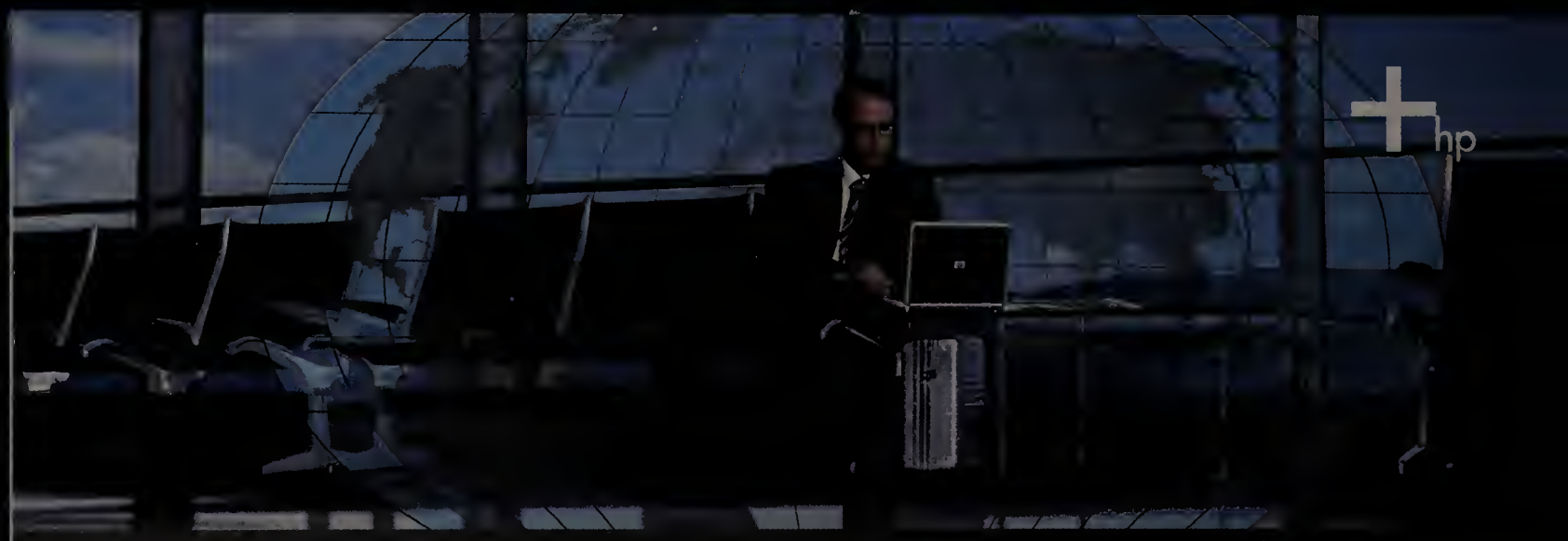
Established:
1999

Number of Employees:
11,000

Business Profile:
University Health Network is made up of Toronto General Hospital, Toronto Western Hospital and Princess Margaret Hospital. Each hospital retains its identity and name within the network. Primary funding for University Health Network comes from the Ontario Ministry of Health. With an operating budget of over $850 million, the University Health Network is one of Canada's largest teaching hospitals.

Deployment History:
The first phase of this project (the digitization of all the documents and the establishment of a centralized administration management console that will be able to overview and control operations) is complete. The second phase, which will be integration with the back-end systems from the various institutions, is under way.

University Health Network



What was a wireless fantasy is now a wireless reality.

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HP COMPAQ BUSINESS NOTEBOOK nx7000

Thin and wide

Starting at:

$1,699

- Intel® Centrino™ mobile technology with Intel® Pentium® M processors
- 15.4" WXGA display provides a wide viewing angle about 1.36" thin with improved thermal performance
- Integrated 802.11b to meet wireless LAN needs
- ATI Mobility Radeon 9200 Graphics with (32 or 64MB) of Double Data Rate (DDR) SDRAM provide impressive graphics performance
- Microsoft® Windows® XP Professional

HP COMPAQ BUSINESS NOTEBOOK nc4000

Ultraportable

Starting at:

$1,699

- Intel® Pentium® M Processors
- Weighs 3.5 lbs., measures 1.1" thin
- Optional integrated 802.11b/g or 802.11a/b/g mini PCI combo card to meet current and future wireless LAN needs
- Optional integrated Bluetooth™ allows users to set up their own personal area network†
- Six-cell lithium battery provides up to 3.5 hours of battery life; up to seven hours with optional travel battery
- 12.1" TFT display, full-size keyboard with dual pointing device
- Microsoft® Windows® XP Professional

COMPAQ EVO n620c

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$1,450

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- Lithium-Ion battery technology gives up to six hours run time on the primary battery and up to 10 hours with the optional Multibay battery
- Stay connected with an integrated 10/100/1000 (Gigabit) NIC and optional wireless MultiPort or PC Card devices
- Microsoft® Windows® XP Professional

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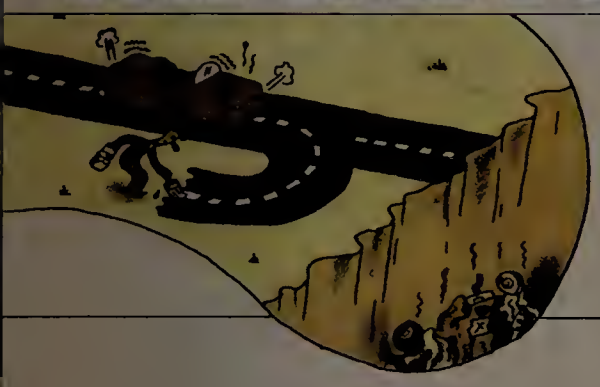


IT Turnarounds
Is your IT shop a mess? Here's a 30-day plan for fixing a failing IT organization, from a former CIO who's done it several times. **Page 44**

QUOTE OF THE WEEK

"Without the tools to measure and report a business-centric view of IT, it's difficult, if not impossible, for companies to bridge the gap between IT and the business." – George Lin, CIO, Documentum, Page 46

RICHARD BORGE

Innovation Interruptus

Several years of budget cuts have unplugged many innovative IT projects. But some pockets of creativity remain. By Thomas Hoffman

YOU CAN'T just throw money at innovation. And savvy CIOs know that it's not a question of how much you invest in IT but how wisely you do so.

But after several years of IT budget-cutting throughout corporate America, many observers say that innovation has indeed suffered, though it hasn't been snuffed out entirely. In a *Computerworld* online survey of 106 IT professionals that was conducted last month, 70% of the respondents said their IT departments have dropped or delayed "especially innovative projects" in the past two years. The No. 1 reason given was budget cuts.

Looked at a different way, only 24% of the IT professionals said they're working on "strategic IT projects that will revolutionize the way business is done" in their industries.

But observers say other forms of IT innovation have surfaced during these lean years. "If you have read Darwin, [you know] the species has to innovate to survive, and if you don't innovate, you die," says Paul A. Strassmann, former CIO at the U.S. Department of Defense and a *Computerworld* columnist. He says the current IT budget hardships are a "driving force" that will favor innovation.

"People have to be very innovative to support a corporation while the funds are shrinking," says Strassmann. He points to experimentation with offshore outsourcing, Web services and "anything that's going to save your ability to support" business activities.

"If you have read Darwin, [you know] the species has to innovate to survive, and if you don't innovate, you die."

Paul A. [illegible] the U.S. Depart[illegible] of [illegible] and *Computerworld* colu[illegible]

But there's a difference between creative spending during tough times and investing in IT to achieve competitive advantage. Companies such as Wal-Mart Stores Inc., United Parcel Service Inc. and RadioShack Corp. have continued to increase their annual investments in IT — albeit in low, single-digit increments — to help them maintain or achieve leadership positions in their markets.

"Those who historically have known how to invest in technology for competitive advantage have continued to do so, probably at a slightly slower pace due to the general economic slowdown. But those who had no clue still have no clue," says John Parkinson, chief technology officer for the Americas region at Cap Gemini Ernst & Young in Chicago.

Wal-Mart is a prime example of a company that continues to invest

Continued on page 42

Continued from page 41

heavily in IT to retain its top ranking in the retail market, says Parkinson. In June, the Bentonville, Ark.-based retailer announced that it's requiring its top 100 suppliers to begin tracking their shipping pallets using radio frequency identification tags by early 2005 [QuickLink 39181].

Bold IT projects such as that can help a company like Wal-Mart squeeze another half point or point of profit margin from its revenue, which is a big deal in the retail industry, where 1% to 3% profit margins are the norm, Parkinson adds.

Still, Wal-Mart is an exception in the current IT spending climate. For example, midtier automotive and aerospace manufacturers that have seen 30% to 40% of their revenue base evaporate in the past three years as a result of the economic slowdown have made Draconian cuts to IT spending, Parkinson says.

However, some bigger manufacturers, such as DaimlerChrysler AG, are still making big bets on IT. Last November, the world's third-largest automaker announced that it was in the early stages of a huge investment in automating the design of its manufacturing plants [QuickLink 34758]. The project, called Digital Factory, is aimed at reducing the company's new-vehicle production cycles by up to 30%.

"As the economy has gotten tougher for all companies, we've been forced to focus on all aspects of costs, and you start doing a much better job of aligning business priorities with IT priorities," says Susan Unger, CIO at DaimlerChrysler.

Change Agent

Many companies that invested heavily in IT during the late 1990s are now deemphasizing new IT investments and instead focusing on making existing technologies more effective. In the *Computerworld* survey, 51% of the respondents said they're using this period of tight IT budgets to re-engineer business processes.

Fort Worth, Texas-based RadioShack just completed the first year of a multiyear effort to further optimize its supply chain, including assortment planning, inventory management, distribution and logistics, and store operations.

Last year, RadioShack finished installing a supply chain management system from Rockville, Md.-based Manugistics Group Inc. Now the consumer electronics retailer is working with Celerant Consulting Holdings Ltd., a multinational consulting firm in London, to address organizational and behavioral changes needed to make its operations more effective, says Mike Kowal, senior vice president of operational effectiveness at the $4 billion company.

One reform has been to align corporate strategies with how workers and managers are actually compensated — something that's out of alignment at many companies. For instance, inventory managers typically want to minimize product inventories to hold down costs, but merchandising managers want to ensure the greatest selection of goods at each store. Now both sets of RadioShack executives have bonus incentives to keep store inventories as lean as possible.

The results? As of June 30, RadioShack was carrying 18.1 weeks of supply (the amount of time it would take it to deplete its inventory). That's a six-week improvement over its year-end 2002 supplies. Inventory management and other process improvements — such as reducing its new-product development cycles from nine months to seven months — have helped RadioShack cut $40 million in costs, says Kowal.

Grounded in Technology

In the *Computerworld* survey, 52% of the respondents said they're working on IT projects that will provide their companies with a major competitive advantage.

That's certainly the case at fierce industry rivals such as UPS and FedEx Corp., both of which have been investing heavily in IT since the 1980s in their respective bids to become the world's most efficient package-delivery company.

Donald Broughton, a transportation analyst at A.G. Edwards & Sons Inc. in St. Louis, says UPS "is the gorilla in ground transportation and has been for decades." But UPS has yielded some of its market share to FedEx over the past decade, since "shippers like to have more than one supplier."

Broughton says the decision by UPS and FedEx to invest in technology is grounded upon a single acid test: "Will it improve my ability to operate?"

Like other leading companies, UPS has scaled back its IT spending over the past few years, having gone from 12% to 14% IT budget increases in 2000 and 2001 to 1% to 3% annual increases since then, says CIO Ken Lacy.

But that doesn't mean UPS has frozen innovative IT spending. For the past six years, UPS has invested roughly $1 billion on a "smart-label" project that will make it easier for customers to track the whereabouts of their packages.

As part of the effort, UPS plans to invest $127 million over the next five years to deploy a new handheld terminal called the DIAD IV to 70,000 drivers [QuickLink 37803]. The DIAD IV, which features built-in cellular, wireless LAN and Bluetooth short-range wireless systems, enables drivers to download routing instructions for the day. Previously, UPS drivers had to manually input a customer's address and other information and scan the bar code on a package.

Now, says Lacy, the information "is in stop-by-stop order, and the driver doesn't have to key in the information anymore." In addition, Global Positioning System technology automatically alerts the closest driver to a package pickup.

"Anything you can do to be more efficient in transporting and delivering packages on a global basis" will help maintain or achieve competitive advantage, says Lacy. **41357**

Productivity Slippage

The dip in corporate IT innovation may produce a dip in U.S. economic statistics, too. "We're going to pay the price for this down the road, three to five years from now, when productivity growth is lower than it should be," says Erik Brynjolfsson, the Schussel Professor of Management at MIT's Sloan School of Management.

"Right now, we're harvesting the productivity investments" from the late 1990s, Brynjolfsson says, referring to the massive investments that companies made in IT during the dot-com boom. "But if the pendulum swings too far, we risk cutting short the benefits."

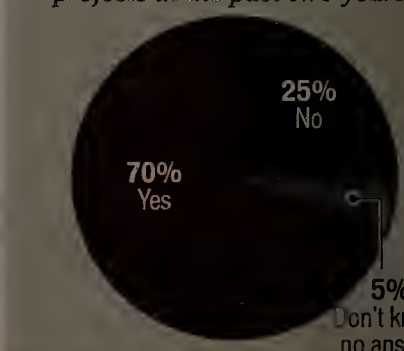
In 2002, U.S. productivity grew at a 4.8% annual rate – a staggering figure, considering the weak economy. Brynjolfsson expects U.S. productivity to grow at an annual rate of 2% for the next few years, much like it did in the 1990s. But if companies continue to trim their IT investments, says Brynjolfsson, "I may trim that [forecast] back a bit."

– Thomas Hoffman

Exclusive Computerworld Survey

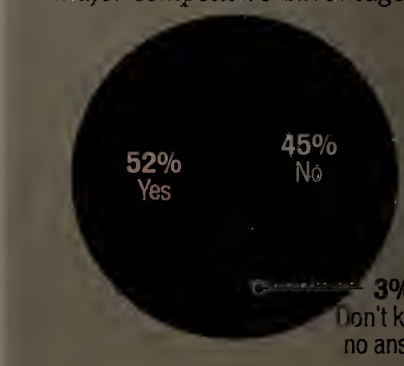
Compared with two years ago, do you think your IT department is...

Has your IT department dropped or delayed especially innovative projects in the past two years?

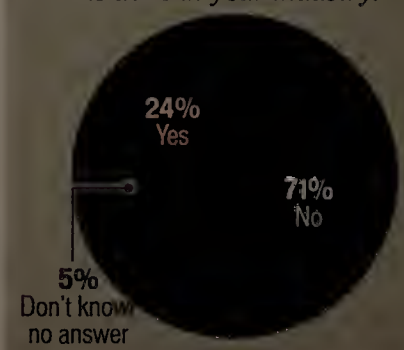


Are you working on any strategic IT projects that will...

...provide your company with a major competitive advantage?



...revolutionize the way business is done in your industry?



Base: Online survey of 106 IT professionals (managers, technical staff and contractors)
SOURCE: COMPUTERWORLD.COM, AUGUST 2003

OK, our marketing is not as good as our technology.

Business Intelligence Vendor Rating

	Marketing Rating	Technology Rating
MicroStrategy	★ ★ ★	★ ★ ★ ★ ★
Cognos	★ ★ ★ ★	★ ★ ★
Business Objects	★ ★ ★ ★ ★	★ ★ ★

Source: Leading Industry Analyst (2003)

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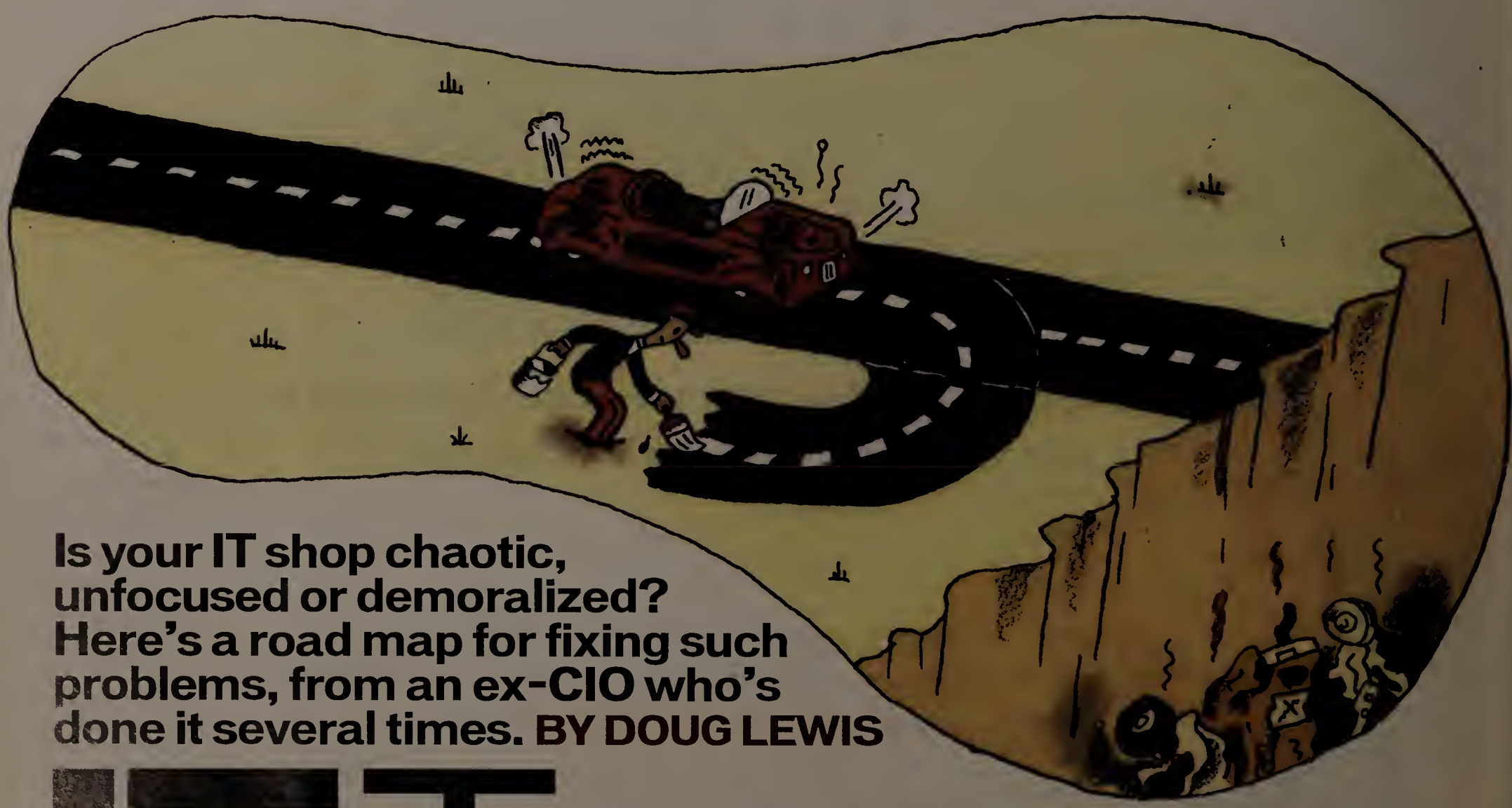
IT Turnaround

Is your IT shop chaotic, unfocused or demoralized? Here's a road map for fixing such problems, from an ex-CIO who's done it several times. BY DOUG LEWIS



MARC ROSENTHAL

"OUT OF CONTROL." "No value." "Too late with too little." "Disconnected from the business." Those are all common comments about failing IT organizations. Management magazines tell of CIOs unable to cope in the boardroom and IT organizations spending the bulk of their resources on projects totally unrelated to business strategies. Unfortunately, the stories are all too often founded in fact and accompanied by news of the replacement of yet another CIO.

So, let's assume you're the shiny new CIO, ushered into the corner office by the CEO and chartered to "fix this mess." After the CEO pats you on the back and tells you how glad he is to have you on the team, what do you do? Is there a reliable formula for a successful turnaround? Are you going to get the bonus or the boot? That will largely depend on what you do in your first month.

There's a formula for this critical first month that will work in almost every IT turnaround. It has worked for me in three major companies and a spin-off.

Troubled IT organizations exhibit five basic symptoms. They're chaotic, unfocused, poorly led, demoralized and alienated. Each symptom has a root cause and, fortunately, a remedy.

CHAOS

This is what nails most CIOs. Chaos offends the inherent sensibilities of chief financial officers and leads to the old adage that the CFO is the natural predator of the CIO. CFOs are paid to protect the financial assets and reputations of their companies. Cost overruns, unpredictability, failure to deliver promised results, and reports that are obscured by incomprehensible verbiage all threaten the CFO's ability to assure the CEO and the board of directors that the company's coffers and reputation are safe. The CFO must react in order to eliminate chaos, and that reaction often leads to the elimination of the CIO.

CEOs, likewise, are under intense pressure from the board and shareholders to deliver predictable results. CEOs get nervous when CIOs don't meet schedules and overrun budgets, and they will remove the source of that irritation: you.

Financial chaos occurs when the authority to spend money is disconnected from the accountability to adhere to a budget. Generous spending authority is delegated to surprisingly low levels

within the organization that have little visibility and fewer controls. No one knows how much money is being spent, who's spending it, what's being received or how to get the situation under control. The cure is a three-step process:

1. Ask the CFO to appoint a key person to help you gain control of and manage IT finances. This person must report to the CFO. You must hand over 100% of the IT financial reporting to this person and make this person your most trusted adviser. Don't allow anyone not reporting to this person to be involved with anything remotely financial. Having an independent finance person reporting on IT gives you instant credibility.

2. Tell your direct reports that staying within budget is their ticket to play. They don't win bonus points for simply making budget; they just get to keep their jobs. Allow some time for them to bring their budgets under control, but don't be overly generous. The CFO isn't going to give you much slack either.

3. Immediately remove all spending authority below the lowest level that you're holding responsible for budget accountability. Enlist the purchasing department as your control mechanism; it must be able to prevent employees from issuing purchase orders that don't correspond to your new financial controls.

FOCUS

You'll quickly hear from the business leaders that IT isn't supporting the key strategic thrusts of the company and, generally, isn't delivering value. These business leaders get paid based on the successful execution of the CEO's strategies, and they get really steamed about anything threatening their net worth. You must become a part of this senior team, and you need to use its playbook. Quickly get your resources refocused on key strategies.

1. Use your new finance person to find out who's doing what. Build a list of active IT projects, including project name, the business-unit project sponsor, approved budget, spending to date and key milestones.

The list will show that your people are working on too many projects, they're working on the wrong projects, spending doesn't line up with the strategic projects, there aren't identifiable business sponsors or too much work is going into very minor activities. You'll find lots of little projects hidden under the guise of maintenance. Kill them immediately.

You'll find 50% of your total development budget spent on "maintenance." Cut it in half, and let your team know you don't want any tears or failures. Pay your maintenance manager to deliver appropriate service levels at ever-decreasing costs.

2. Make a list of the few projects – no more than five – that are truly strategic and well aligned with the CEO's vision. Validate your list with your staff and your new finance person. Then talk with the business-unit heads. Ask them if you've got the list right. Replace any of the five with more important projects, but don't add a sixth.

Lastly, talk to the CEO. The key message is that you're going to stop all development on projects other than these five and you're going to focus all your resources on them. This takes guts. But keep this in mind: If you're successful on all the little projects and fail on the big ones, you're history. If you get the big ones right, the little ones won't matter and you'll probably collect an embarrassingly large bonus.

3. Communicate the process to your management and staff. Some will be nervous if their projects don't make the top five. Reassure them, but don't promise them what you can't deliver: absolute security. After all, no one is promising *you* job security.

LEADERSHIP

Here comes the tough stuff. By this time, you'll have a feel for which senior IT managers are going to make it and which aren't. Don't fire anyone — yet. Go to the senior human resources executive and ask for a key HR person to be assigned to IT. The person must report to the senior HR executive but will be supporting you.

Have your direct reports do a 360-degree assessment of the IT managers, including yourself. Look for a balance of leadership types. You'll want someone to balance your style. If you're intuitive, you need a detail-oriented counterbalance. If you're into process and detail, look for an ideas-oriented leader. Discuss the 360-degree assessment with your team and the CEO. Let them know what you intend to do after seeking their input. Then, do what you have to do. Don't put off unpleasant actions. Wait too long, and it becomes impossible to do the deed.

"CEOs get nervous when CIOs don't meet schedules and overrun budgets, and they will remove the source of that irritation: you."

ALIENATION

You'll find evidence of alienation everywhere: Customers don't attend project meetings. Mistrust and even anger characterize interactions between business and IT. There's a pervasive lack of communication between IT and the business side. This problem has to be addressed upfront and quickly.

1. Personally accept responsibility for fixing the problem. Ask the CEO to let you address the executive management committee and then acknowledge the problems honestly. Use the refocused project list to show that you're sensitive to the company's strategic initiatives. Have your finance person report on your financial accountability actions. Have your HR person report on the 360-degree evaluations and your plans to build new leadership skills.

But don't make promises at this stage. You're not expected to have all the answers yet, and to pretend that you do would destroy the credibility you're trying to build. Your success will depend on your ability to build trusting relationships at this senior level. Trust is built on doing what you said you would do, every time.

2. Use your team, your finance person and the HR staff, and even outside consultants, to develop a balanced IT scorecard. Keep it nontechnical and concise. Shop the scorecard with the management committee members and your key customers. Use it to brief the CEO on a monthly basis.

So in the first month, build your senior team, seize control of spending, refocus your resources, select a morale-building milestone, and create a balanced scorecard. It's a packed schedule for one month, but it's doable, and you'll never get a better opportunity to get started right. **41369**

Lewis recently retired from his position as CIO at InterContinental Hotels Group PLC and started The Edge Consulting Group LLC in Atlanta. You can contact him at edgeconsulting@bellsouth.net.

Fixing Morale Problems

IN THE FAILING IT ORGANIZATION, you'll find that morale stinks worse than week-old roadkill. IT staffers have been repeatedly characterized as losers, and it has sunk in. People who think they're losers will act like losers. People who act like losers perform like losers, and the hole gets deeper and deeper. You need to break the cycle. The best way to break a losing cycle is with a success.

1 Work with your staff to select a target milestone from the list of five major, strategic IT projects. The deadline needs to be close and challenging but doable.

2 Go public. Talk to your management and staff. Ask for their support. The message is that meeting the milestone is critical to the business and that you, personally, are dog meat if the organization fails. Put your butt on the line. Make it personal. (After all, it really is.) Make progress reports public. Go to the project meetings. Ask questions. Stay involved. Address issues quickly and forcibly. Act every second as if you expect success. Address problems, but never allow the possibility of failure.

3 Celebrate like crazy when the milestone is met. Throw a big party. Invite the business executives, including the CEO and chief financial officer. Now repeat the process, but with three to five milestones from the five major projects you've selected. The strategy is to create a chain of successes. People will begin to believe they can be winners. Once that belief creeps in, it's unstoppable.

– Doug Lewis

SHARP

Digital Document Security and IT: Everything you need to know.

Q: What are the most significant digital copier security issues?

A: Various copier print controllers are actually servers that queue and permanently store multiple document files, providing administrator access to the documents. At a minimum, most digital copiers retain the last document processed; some even retain multiple documents totaling hundreds of pages. Others redirect print jobs when the printer is busy or jammed, making "denial of service" attacks possible.

Q: How does Sharp protect the network interface?

A: The Sharp Ethernet card allows administrators to restrict access and disable unnecessary protocols. With this network card, the Sharp digital copier is essentially protected by its own firewall.

Q: How can you be sure that security products actually perform as claimed?

A: The Common Criteria program—administered by the U.S. National Security Agency and the National Institute of Standards and Technology—evaluates security solutions. Products that are validated under the program meet security levels consistent with ISO 15408 methodology.

Q: How can Sharp improve IT security?

A: Sharp offers print privacy solutions designed to restrict unauthorized personnel from seeing confidential materials. Copier access can be controlled and monitored, while documents retained in printer/copier/scanner/fax memory are immediately cleared to eliminate unauthorized access.

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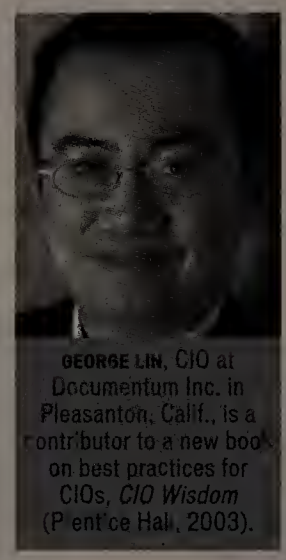
GEORGE LIN ■ PEER TO PEERS

Challenges of Running IT Like a Business

IN TODAY'S SLUGGISH ECONOMY, companies are demanding that their IT organizations make wise investments and demonstrate IT's value to the business. They need proof of this value in the form of business metrics, not traditional IT measurements such as uptime and throughput.

For many IT executives, this is the first time that they've been expected to run their organization like a business. And it's not easy. IT has typically operated as a monopoly — employees have been required to use internal IT services — and breaking up a monopoly is never easy.



GEORGE LIN, CIO at Documentum Inc. in Pleasanton, Calif., is a contributor to a new book on best practices for CIOs, *CIO Wisdom* (Prentice Hall, 2003).

Breaking up the IT monopoly and transforming IT into a competitive business within a business is good for IT, good for the overall business and good for the economy. It increases IT's credibility and helps the entire organization to realize the true value of IT, which can fuel reinvestments in IT. It also reduces the exodus of IT jobs offshore.

But before you overhaul your IT organization to operate more like a business, it's important to understand the following challenges:

1. Resistance within IT. Running IT like a business requires a shift in the mind-set of the IT staff, because breaking up the monopoly changes how IT operates and how it's perceived within the organization. And this type of change often generates fear of the unknown. It pushes IT people out of their comfort zones. So it's essential to have a well-defined and well-communicated transformation plan.

Involve people early on so that they can drive instead of being driven. Engage people in behavior-changing workshops and "soft skills" training sessions. Everyone should feel excited and empowered, very much like what people feel when working at a start-up company. It's an opportunity for IT to take control of its own destiny by competing for, and winning, the company's IT business.

2. Business metrics are required. To operate as a competitive business within a business — instead of a cost center — IT must transform itself into a service organization, with clearly defined core competencies, service portfolios, guarantees of quality and standard costs. This can't be done without relevant business metrics.

Proper IT governance requires metrics about operations, projects, user demand and finances to ascertain the business health of the IT organization. Furthermore, IT executives must have access to relevant information about IT's customers, partners and competitors. Having these metrics and reporting them internally to the entire IT leadership team in a timely manner can show what's working and where improvements should be made. They're also required for IT "marketing and sales" campaigns.

3. Business/IT alignment is a prerequisite. As an internal service provider, IT must understand and even anticipate the needs and goals of its customers. Alignment ensures that IT focuses resources on business-critical tasks and applies limited budgets to achieving the greatest business benefit. With proper quality, productivity and cost reporting, IT can begin to articulate its value to the business.

Only when business/IT alignment is achieved can IT managers begin to gather requirements from internal customers and develop a comprehensive catalog of IT products and services (with appropriate support levels, well-defined service-level agreements and competitive prices).

Internal customers can then assess the IT group's offerings and choose to retain its services or to use a more competitively priced vendor. If the internal IT group is competitive with other sources or provides extra value, it will win the contract.

4. IT needs business management tools, too. While IT organizations have good tools that address the technical side of IT, they typically lack tools that address the business and people aspects of IT, such as ERP-like software tailored for the IT operation. Yet IT executives must make intelligent decisions on how to optimize resources and operations and how to communicate the business impact of their resource allocations.

Business leaders need to know where IT dollars are being spent and how effectively those dollars are contributing to overall business goals. Without the tools to measure and report a business-centric view of IT, it's difficult, if not impossible, for companies to bridge the gap between IT and the business.

Breaking up the IT monopoly and transforming IT into a competitive business within a business is a win-win situation for everyone. But IT executives must first tackle these challenges, or else this internal IT start-up company will fail. **41531**

STEAL

*Trends in Proprietary Information Loss Survey (ASIS 2002). ©2003 Sharp Electronics Corporation.

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Protect your information with the Data Security Kit from Sharp. Financial facts, personnel records, customer lists: networked copiers/printers process sensitive information every day. Unfortunately, their hard drives can also be accessed via the network, contributing to $60 billion worth of information theft every year.* To protect this weak link in your corporate security, we've created our Data Security Kit. It's the first copier and printer protection to be validated by Common Criteria, a government-sponsored program, and it's available only with our Digital IMAGER™ series of copiers/printers. Sharp's Data Security Kit. Enhanced information protection at your fingertips. sharpusa.com/security

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GAVS Information Services seeks applications for a number of positions located in Denver or Louisville, Colorado. Applicants should send resumes to Prakash Vasant, GAVS Information Services, 4155 E. Jewell Avenue, Suite 603, Denver, CO 80222.

Please specify the job order number for the position(s) that you are applying for. All positions involve full-life cycle software development for software applications that incorporate client/server technology, are web-based, and/or involve data warehousing applications and data reporting tools.

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Requirements include Bachelor's Degree in Computer Science, Engineering, or related field, including Computer Applications; software development experience; working knowledge of Dispatch 1 ERP software applications, Oracle, PCVS Dimension Version Controller. (Job Order No. 002).

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Requirements include Bachelor's Degree in Computer Science, Engineering, or related field, including Computer Applications; software development experience; working knowledge of PL/SQL, Infomaker, Unix Shell Scripting, Oracle Enterprise Management, and Data Modeling. (Job Order No. 003).

Software Application Developer:
Requirements include Bachelor's Degree in Computer Science, Engineering, or releted field; software development experience; working knowledge of Oracle, ACTAWorks, SAP Basis Administration, BMC Patrolling Software. (Job Order No. 004).

Software Application Developer:
Requirements include Bachelor's Degree in Computer Science, Engineering, or related field, including Computer Engineering; software development experience; working knowledge of J2EE, SQL/Server, Visual Basic, and Automated Testing. (Job Order No. 005).

Software Application Developer:
Requirements include Bachelor's Degree in Computer Science, Engineering, or releted field including Computer Applications; software development experience; working knowledge of Unix Shell Scripting, Oracle, TOAD, Oracle Enterprise Server Manager. (Job Order No. 006).

Software Application Developer:
Requirements include software development experience; working knowledge of ASP, Oracle, FoxPro, Java. (Job Order No. 007).

Senior Software Application Developer:
Requirements include Bachelor's Degree in Computer Science, Engineering, or releted field, including Computer Applications; software development experience; working knowledge of Dispatch-1 ERP Application, Data Warehousing, PVCS Dimensions, Oracle Relational Database Management Systems. (Job Order No. 008).

Software Application Developer:
Requirements include Bachelor's Degree in Computer Science, Engineering, or related field, including Production Engineering; software development experience; working knowledge of Oracle and SQL/Server RDMBS, J2EE Web server, JDBC Database Adapter. (Job Order No. 009)

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Please indicate the location and the position you are applying for.

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Aztek Engineering, Inc. seeks Sr. Systems Engineer to work in Boulder, CO to engage in full life cycle development in telecom systems. Requires bachelor's in electrical engineering; 4 years experience in full life cycle development of systems requirements and hardware architecture for Class 4 and Class 5 central office systems platform and in ASIC and FPGA design using HDL languages; and working knowledge in voice over packet (VOP) gateway design and IP and ATM system design using C/C++ programming languages. Respond by resume to Debra Chernak, Aztek Engineering, Inc., 2477 55th St., Suite 202, Boulder, CO 80301 and refer to job #0782.

Software Engineers to design, develop, test wireless/web software systems & services for devices including WAP Phone, Pocket PC's, etc. using Java, JSP, VB, VBA, SQL, Web Servers, Weblogic, HTML, Ms Access and WCTP under Windows, UNIX OS; perform req analysis to determine tech. feasibility; study/evaluate new tech./methodologies; provide guidance for complex user problems. Require: M.S. or foreign equiv. in CS/Engg. (any branch). Competitive salary. F/T. Respond to: HR, Air2Web, Inc., 1230 Peachtree Street NE, Promenade II, 12th Fl., Atlanta, GA 30309.a

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Computers - Programmer Analysts needed. Seeking qual candidates possessing BS or equiv. and/or relevant work exp. Part of the req. relevant work exp. must include 2 yrs. working with iPlanet, Oracle, Unix Kernel Tuning & System administration. Mail resume & ref. to: Object Solutions, Inc., Attn: HR, 3025 Harbor Lane, #312, Plymouth, MN 55447-5119.

Systems Analyst: Design software programs for company in the area of accounting; Creates & maintains company database; Designs & maintains the Internet & e-business strategy & the website of the company; Works w/Macromedia flash & Photoshop; Works w/ASP & cold fusion; Works w/SQL server 7.0-BS in Computer Information Systems & 2 yrs of exp.,40-per wk, 9-6PM, Fax resume to: Alexander Motors Int. Corp. Attn: David Adrian Soae (000) 000-0000

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Chief computer programmer needed to maintain and refine a business simulation software system that is used for business training in marketing, manufacturing, accounting and finance. Requires BS or foreign equivalent in Computer Science or related field and 2 years in related job or 2 years in Computer Programming. Experience must include 2 years designing, implementing, testing, developing and maintaining medium scale software systems; designing and programming SQL databases; application development using Delphi programming environment and development of business simulations; and 1 year in web design using HTML, Macromedia Dreamweaver, Photoshop and Macromedia Fireworks. Send resumes to Ernest R. Cadotte, c/o ILS, 500 Summit Hill, Knoxville, TN 37901.

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Tier1 Innovation seeks applicants for the position of Senior Consultant in Denver, CO to design, develop and configure Siebel applications to meet customer requirements, especially in the pharmaceutical, clinical trials, energy and financial industries. Requirements for this position include a bachelor's degree in business or computer science and 3 yr exp. as a software engineer implementing Siebel packages and in data conversion/migration and integration experience in various Siebel vertical/horizontal packages. Requirements also include working knowledge of Siebel eClinical, ePharma, eEnergy. Sales Force Automation and Call Center packages, as well as Informatica 6.x/5.x, Siebel 7.x, Siebel EAI, Microsoft SQL Server, Oracle 8.x and Unix. Applicants must have Siebel 7 certification Respond by resume to Jill Colbeck, Tier1 Innovation, 4600 S. Ulster St., Ste. 700, Denver, CO 80237.

Principal Software Engineer will make enhancements to existing applications and initiate & architect new development projects; participate in client server application design and development; apply knowledge of the full product development life cycle, from requirements definition through architecture, coding, and release to develop & maintain Windows & Web-based applications related to Co's portfolio & performance systems technology architecture. Will review portfolio management requirements & design and code based upon developed specs; solve technical problems & alert technical lead of issues/obstacles; work directly w/business users to specify functional and technical requirements; and also work w/junior Software Engineers, Database Administrators, Systems Administrators; Users & Management to manage/control design, development, testing and software implementation related to portfolio & performance systems.

Will provide estimates of work and participate in project planning; perform internal scripting to develop dynamic code in secure web applications. Requires Bachelor's or equivalent in C.Sc., Engineering, Math, or Physics plus 5 years in job offered OR 5 years exper in Sybase database development. Candidate must also possess demonstrated expertise writing UNIX shell scripts and stored procedures in SQL; demonstrated expertise programming database loaders and extract jobs using Autosys & demonstrated expertise managing Sybase replication functions, Sal: $90,500/yr, M-F, 9A-5P. Send 2 resumes to Case #200202853, Labor Exchange Office, 19 Staniford St., 1st fl., Boston, MA 02114. EOE. Applicants must be U.S. workers eligible to accept full-time U.S. employment in U.S.

SOFTWARE ENGINEERS (12 positions): require Bachelor's or equivalent in Engineering/ Computer Science/Mathematics/ Science or closely related field with two years experience providing skills in described duties, at $79,000 per year. Provide on-site consulting in design, analysis and development of software applications for legacy systems in IBM mainframe environment; development and administration in Oracle, DB2, SQL Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems development with Netscape Server and related tools; SAP R/3 applications on Windows with DOS and ABAP/4 and related modules. 40% travel to client sites in the United States. Mail resumes to: YASH Technologies, Inc., 605 17th Avenue, Suite 1, East Moline, IL 61244.

Computer Supp. N'work Enng: Design, install & support multi-vendor network services and components. Requires: 2 yrs. exp. in job off'd or 2 yrs exp. as a Tech Analyst or related with same duties & B.S. in Comp. Sci., Elect Engg or related or 3 yrs exp in job off'd or 3 yrs exp as a Tech Analyst or related with same duties & 2 yrs college ed in Comp. Sci., Elect Enng or related. Exp. ref. required. Send resume to: Vertex Soft, Inc., 622 Georges Road, Ste 104, N. Brunswick, NJ 08902.

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- JAVA, HTML, Active X
- Web Commerce
- SAP/R3, ABAP/4 or FICO or MM & SD
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Engineer, Application, Sr. wanted by Co. engaged in dvlpmt & mktg of debit card. Must have BS in CS/EE &/or related tech field w/5yr exp. (or MS w/2yr exp). Reply to HR, Attn: T. P., Med-I-Bank, Inc., 1601 Trapelo Rd., Waltham, MA 02451.

Prog/Analysts to analyze, design, test datawarehousing, software applns using Cognos, COBOL, DB2, HTML, Java, JScript on UNIX, Windows OS; gather, document reqs from user community; test, troubleshoot project appln code accor. to system objectives. Require: BS or foreign equiv. in CS/Engg.(any branch) & 2 yrs exp in IT. Competitive salary. F/T. Travel involved. Resume to HR, Smartsoft International, Inc., 4898, South Old Peachtree Rd, Norcross, GA 30071

Seeking qualified applicants for the following positions in Memphis/Collierville, TN: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree* or equivalent in computer science, MIS, math, engineering or related field plus 5 years of experience in systems/applications development. Experience with J2EE development using UML modeling; UNIX Scripting; and SQL Scripting also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

Project Leader-Lead and manage IT projects developed on the client/server web environment within prescribed quality, time frame, and budget: ascertain user requirement and program objective; determine methodology and design approaches; guide team members with technical issues; assign and review work of programming personnel: track project progress; recruit and train new IT consultants; and research in new technology. Use various tools and platforms such as C/C++, SQL, PL/SQL, InterDev, ASP, VBScript, Oracle Database, and HP-Unix. Reqs: Bachelor or equivalent foreign degree in Computer Science or Computer Engineering and 5 years experience in a related occupation as a Software Engineer, Programmer Analyst, or Systems Analyst. Must have 3 years experience with development system on the client/server environment and using at least 5 of the tools/platforms listed above. 40 hrs/wk, 7:00a-4:00p, M-F, $74,500.00/yr, Overtime $35.82/hr. Work location: Various unanticipated locations throughout the U.S. Send resume to Workforce Development Programs, P.O. Box 46547, Denver, CO 80202 and refer to order #CO 5057516. Application is by resume only.

Senior Field Service Engineer - Install and accept all of the company's test systems at customer sites. Install tester software and connect to customer network. Keep records of the test system up-time and customer part usage. Perform telephone troubleshooting with the customer. Schedule preventive maintenance quarterly to achieve optimum system performance. Monitor performance on all of the company's test equipment. Schedule engineering change orders implementation to modify equipment design. Travel to customer sites and liaison with customer's engineering staff to resolve difficult technical problems. Help to develop and optimize test program for best test results. Requirements include a Bachelor's degree or equivalent in Electrical Engineering or related field and two years of experience in the job offered or related field of supporting semiconductor capital equipment. Requires approximately 50% domestic travel. Applicants must have unrestricted authorization to work in the United States. Salary $82,202/year. 40 hours/wk. Respond with two copies of resume to Case #200202719, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114

Telecomm co. in Framingham, MA seeks Senior Technical Services (Support) Engineer to: provide remote/on-site technical training/engineering support; isolate/resolve customer software and systems installation problems; assist customers to debug complex telephony applications/systems; and provide engineering consultations. Must have: BS in Elec. Eng., Comp. Sci., Engineering, or equiv; 4 yrs communication systems development exp. using C; and knowledge of 2 of the following: SS7, ISDN, wireless technology, IP Telephony & Switching, Fax and CTI. Salary $92,833/yr. Submit 2 resumes to Case #200202668 Labor Exchange Office, 19 Staniford Street, 1st fl., Boston, MA 02114.

Software Developer

Design & develop copy protection & data protection software. B.S. in CS, or rel. w/abil. to use C, Assembler, C++, TCP/IP, PKI technologies, copy protection technologies, authentication & cryptographic algorithms & technologies. 40.0 hr/wk. 9-5. Send resume to: Ms. Rosemarie Marx, Pres., Marx Software Security, 2900 Chamblee Tucker Road, NE, Bldg. 9, Ste. 100, Atlanta, GA 30341

Infomerica is looking for system/programmer analysts, software/project engineers & computer consultants working at different sites (travel required). Candidates must have BS with exp. in IT fields. Skills of Oracle, Informix, Java preferred. Send resumes to info@infomericainc.com

K&M Softech is looking for programmer/system system, software/project engineers or IT professionals. Both entry & experienced levels needed. Some positions require travel. Skills in C/++ VB Oracle, SAP, SQL are plus Please send resumes to Recruit@kmsoftech.com. EOE

Engineer, IT Tech. Development: Web related & server-side R&D, w/ Object Oriented Design. JAVA app. development; implement Contents Mgmt Syst.; use BEA Weblogic, Apache Web server etc. for campaign mgmt, personalization of company websites, transfer of svc to Web-based. Create enterprise connections & data-sync between web servers in US & Korea w/ JMS. B.S. in Computer or related eng'ring, + 2+ years J2EE Technology implementation, BEA Weblogic & core server-side programming in JAVA. Send resume to Robert Ang, Korean Air, 1813 Wilshire Blvd., Los Angeles, CA 90057.

Programmer Analysts for Omaha, NE office. Develop & maintain software applications using DB2, IMS, DB/DC/ADF, Teradata, Datacom, DB/DC, PL/1, Assmbler, Natural ADABAS. Bachelors req'd in Computers, Math or related field of study +2 yrs of related exp.40 hrs/wk. Must have legal authority to work permanently in the U.S. Contact HR Manager, Computer Manpower USA, Inc. 15 Old Forge Dr, Warren, NJ 07059

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Experts, Inc is looking for
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Systems Architect:
Master's degree in Artificial Intelligence with 6 months of experience. Required to analyze software suitability, define databases & application patterns, write requirements for system architecture, develop & integrate project using C++, VC++, COM, Persistence, Oracle, Visibroker, ISS, Rational Purity & Quantify, Rational Rose, Rogue Wave Libraries, OLEDB for IP , iMAN and iMAN/DAV portals.
Programmer Analysts:
Bachelor's degree in computer science/related field with 2 years experience in JAVA, J2EE, Design Patterns, JSP, Servlets, JDBC, EJB, HTML, XML, Java Script, C++, PL/SQL, Oracle, BEA WebLogic. Sun Certified Java2 / Sun Certified Web component developers for J2EE platform preferred.

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Send Resume to ExpertsInc 10342 Conser # 2JW, Overland Park KS 66212.

Software Consultant/Programmer Analyst. Functional requirement analysis & identification of technical enhancements for management information systems. Software development & coding. Technical environment: Visual Basic; C++; SQL Server; InstallShield; Windows. Bachelor's degree in Comp. Sci. or Comp. Eng. + 2 yrs. exp. in job offered or as Programmer Analyst or Programmer req'd. Previous exp. must include: InstallShield; Visual Basic; C++. Must be Microsoft Certified Professional. 40 hrs/wk, 9am-5pm, $65,000/yr. Must have proof of legal authority to work in the U.S. Send your resume to the IA Workforce Center, 800 7th St., SE, Cedar Rapids, IA 52406-0729. Please refer to Job Order IA1101779. Employer pd ad.

Programmer/Analyst: Develop/write programs using HTML, WebBase, PhotoShop to store, locate & retrieve information for internal systems of comp. Sci. grad. school. Design/develop programs to operate/maintain internal systems, using UNIX, WebBase, PhotoShop. Convert project specs/statements of problems and procedures to logical flow charts for coding into c. language. Develop/implement programming for school's web site. Requires Bach. in Comp. Sci., Electronic Engr'ing or rel. field, w/ coursework in HTML, Unix, WebBase, PhotoShop. 40 hrs per wk. No O.T. 9 am - 5 pm. Salary offered $42,939/yr. Applicants must show proof of legal authority to work in the U.S. Send resume to: IDES, 401 S. State St.-7N, Chicago, IL 60605, Attn: Leila Jackson, Reference #V-IL-34174. An employer-paid ad. No calls - send 2 copies of both resume & cover letter.

COMPUTER/IT
Business Developer & Regional Manager for Latin America. Requires a Bachelor's Degree (or equiv.) in Systems & Computer Engineering or a related field. Must also have 7 years of experience in the job offered or 7 years of experience leading & performing computer risk security assessments. All of stated experience must include: performing information security policy development & strategic planning; implementing security software and policies to protect business infrastructure; performing return on investment analysis; & designing security systems. Must be fluent in Spanish on a business level & willing to travel internationally up to 50% of the time. Job based in Atlanta, GA, but time will be divided between GA & home location. Co. will pay commuting expenses. Send resume to S. Walker, Internet Security Systems, Inc., 6303 Barfield Road, Atlanta, GA 30328.

PROGRAMMER/ANALYST
Design, develop, analyze software projects including the complete life cycle of the software development process. Design, develop OLAP cubes and MDX queries with analysis services in SQL server Database. Web development with ASP.net, ADO.net, VB.net, C#, .net Framework, XML, XSL, VBscript, HTML, DHTML, Javascript, SQLServer 2000. Expertise in architecting web-based solutions and database projects. 40 hours per week, 8:00 a.m. to 5:00 p.m., $56,000/year Bachelor's degree Electronics Engineering or related field. Two years of experience in job offered or related occupation. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 590 Iowa Street Dubuque, IA 52004-0757. Please refer to Job Order #IA1101790. Employer paid advertisement.

Programmer: Consult with clients to determine project specifications; Develop & implement applications to meet client requirements; Supervise junior programmers to ensure compliance with project specifications; Code, test, debug & document software applications. Must Have: Bachelor's Degree in Engineering/Computer Science/ Management Information Systems, 2 yr. exp. in job offered or 2 yr. exp in Information Technology or Programming. Salary: $68,250/yr. Hours: 40 hrs/wk, 8-5/M-F. Submit two (2) copies of resume to Case # 200203000, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

COMPUTER/IT
Sr. Consulting Specialist. Req. Master's deg in Comp. Sci. or rel. field & 3 yrs exp. in job offered or 3 yrs exp. in design of multi-tiered web-based busin. applications. Exp. must incl. use of VB, ATL, C++, C#, XML, ASP.NET, LDAP/ADSI, & .NET technology. Must also have exp. w/enterprise portals & design of enterprise level databases; & complete lifecycle of software design. (Exp can be obtained before or after completion of Master's deg.) Resp. for complete lifecycle of software design, incl. research, design, dev't. & implementation of software components to convert busin. appls. written in legacy technologies to modern day real time e-business appls. Design multi-tiered web-based busin. appls. using various prog. languages & web technologies. Job located in Arlington. Send resume to K. Russ, Resource Consultants, Inc. 2650 Park Tower Dr., Vienna, VA 22180.

Assistant Business Development Officer - Contact new clients in territorial/industry area of responsibility, maintain relationships with established clients, participate in Information Technology development project proposals, support Business Development Officer in negotiating Information Technology development contracts, develop data on required skill sets for project completion, translate technical specifications for project teams, monitor project teams for time table compliance. Must Have: Bachelor's Degree in Engineering/Computer Science/Business, 1 yr. exp. in job offered or Information Technology. Salary: $52,000/yr. Hours: 40 hrs/wk, 8-5/M-F. Submit two (2) copies of resume to Case # 200202994, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Manager, Worldwide Technical Services: Manage central engineering team to provide advanced customer consulting & development services. Interface between prospects, customers & NXN core development team in Germany to turn asset management system for digital entertainment & computer graphics into a versatile solution for any complex digital media project. The position requires ability to read, write and speak in German & 4 years of exp. in the duties of the job offered. Salaried/full time position. Job site/ interview - Venice, CA. Please send resumes to NXN Software Inc., 321 Hampton Drive, Ste. 201, Venice, CA 90291

Assistant Business Development Officer -Contact new clients in territorial/industry area of responsibility, maintain relationships with established clients, participate in Information Technology development project proposals, support Business Development Officer in negotiating Information Technology development contracts, develop data on required skill sets for project completion, translate technical specifications for project teams, monitor project teams for time table compliance. Must Have: Bachelor's Degree in Engineering/Computer Science/Business, 1 yr. exp. in job offered or Information Technology. Salary: $52,000/yr. Hours: 40 hrs/wk, 8-5/M-F. Submit two (2) copies of resume to Case # 200202996, Labor Exchange Office, 19 Staniford St., st fl., Boston, MA 02114.

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in WebSphere, EJB, Visual Age, MQ Series and Oracle. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of WebSphere, EJB, Visual Age, MQ Series and Oracle. Salary: $72,000/year. Working Conditions: 8:00 A.M to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: BECS/CareerLink Program Supervisor, Indiana County CareerLink, 300 Indian Springs Road, Indiana, PA 15701, Job No. WEB359738

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COPY DESK

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ADMINISTRATIVE SUPPORT

Linda Gorgone, office manager.....(508) 820-8176
Cheryl Dudek, administrative assistant.....(508) 820- 8178

CONTRIBUTING COLUMNISTS

Pimm Fox, Michael Gartenberg, Dan Gillmor, Paul Glen, Thornton A. May, David Moschella, Bart Perkins, Nicholas Petreley, Paul A. Strassmann

CONTRIBUTING WRITERS

Mary Brandel, Amy Helen Johnson, Russell Kay, Sami Lais, Kathleen Melymuka

GENERAL INFORMATION

TELEPHONE/FAX

Main phone number.... (508) 879-0700
All editors unless otherwise noted below
Main fax number..... (508) 875-8931
24-hour news tip line... (508) 620-7716

E-MAIL

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Politics

Counterpane Internet Security Inc. "We as security researchers regularly speak, write and do reports that express our professional opinions. We assume that companies hire us for our integrity and honesty."

The authors of the report "CyberInsecurity: The Cost of Monopoly. How the Dominance of Microsoft's Products Poses a Risk to Security" may have actually undermined their independence by teaming with the Computer & Communications Industry Association.

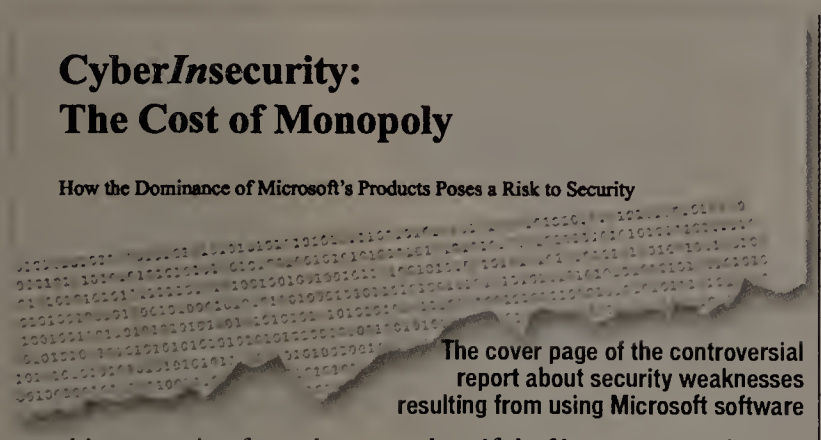
The CCIA is a Washington-based industry group whose members include direct Microsoft competitors such as Sun Microsystems Inc. and Oracle Corp., and it has supported the U.S. and European investigations into what the group has called "Microsoft's competitive abuses." The CCIA not only published and publicized the report on behalf of the researchers, but it also provided a written introduction to the document.

When asked during a teleconference on Sept. 24 about who or what organizations funded the study, Geer, whose firing had not yet been announced, said it was a "personal initiative" by the seven authors that wasn't funded by the CCIA or any third party.

Edward Black, president and CEO of the CCIA, said his organization had no role in developing the content of the report. "These guys did this on their own, and they contacted us because our expertise is in the policy area, and we had the infrastructure to publicize the report in Washington," he said.

"We didn't write the report for CCIA," said Perry Metzger, an independent security consultant and a report co-author.

"All of us are computer security people, not politicians," he said, responding to questions about the appearance of partisanship stemming from the group's relationship with the CCIA. "People should try to make up their own minds about whether or not we're right."



The cover page of the controversial report about security weaknesses resulting from using Microsoft software

Complex Connections

However, users might have a hard time deciphering exactly who the honest broker is in this case. Washington-based Americans for Technology Leadership (ATL) was quick to issue a statement lashing out at the report, calling it a "shameless" campaign by the CCIA to "line the pockets of a handful of large companies."

But ATL's position may have been undermined by the fact that Microsoft is one of the 10 founding members of the organization, which is focused on limiting government regulation of technology.

"Enterprises need to realize that if they haven't heard of an organization that produces a study, it is probably funded by a vendor or other partisan entity," said John Pescatore, an analyst at Gartner Inc.

But in this case, users have found themselves caught in the crossfire with no concrete recommendations from either side. In fact, rather than offering solutions to the problems, the report simply lays blame on a lack of government policy and on senior executives at user companies who insist on purchasing only Microsoft software because of its ease of use and compatibility.

"The blame falls mostly on the buyers, because the sellers are going to sell what the buyers want," said Schneier, who also denied that the CCIA had any influence on the report.

Geer, meanwhile, likened some corporate executives to drug addicts when it comes to their dependence on Microsoft. "Heroin addicts shouldn't buy [heroin]," he said.

Steve McDowell, CIO at Holiday Retirement Corp. in Salem, Ore., cautioned that some of the blame is being misplaced. "I would agree that Microsoft's dominance creates a single target for all the hackers and other criminally minded people to concentrate on," he said. "But I don't think the blame is anyone's but the people perpetrating these crimes." And requiring large companies to deploy multiple operating systems throughout their enterprises is simply a recipe for higher costs and more complexity, he said.

"In our industry, we like standards, because we know that leads to lower costs," said Joe Puglisi, CIO at Emcor Group Inc., a construction and facilities management company in Norwalk, Conn. "If several companies each have to enhance and maintain [a different] operating system, we are likely to see more of a quiltwork of features and pay a higher price for them."

More diversity would also require "an arsenal of tools" to move data around, Puglisi added. **41691**

Jaikumar Vijayan contributed to this report.

Continued from page 1

United Nations

grams in about 140 countries, is moving from a proprietary human resources and financial system to a PeopleSoft Inc. ERP system managed by an application service provider.

The UNDP and the vendors involved in the project — prime contractor Unisys Corp. in Blue Bell, Pa., and ASP Corio Inc. in San Carlos, Calif. — announced the six-year, $27.5 million deal last week.

Sanders said the change is touching every aspect of his IT operations.

"What I would have preferred would have been a risk-free option," said Sanders in an interview in his New York office last week. But there wasn't one, he said. "The [situation] was, take your pick as to which risk you want."

Outsourcing poses significant risks, ranging from the financial viability of the company to which you outsource, to the competence of the people there, said Sanders.

On the other hand, Sanders said he faced the problem of trying "to create from scratch a world-class application management capability" and "leveraging technologies with which we had minimal expertise."

The UNDP operates nearly 170 offices worldwide. These offices send administrative data to the agency's headquarters once a month — much too infrequently for an agency that wants to improve its business processes. And there are other problems.

Overcoming Inadequacy

The in-house system is "feature-thin," as Sanders described it, and local IT managers have developed custom applications that need to be maintained and updated.

The inadequacies of the system also created some "profound anxiety, if not outright skepticism, that headquarters would get it right this time," said Sanders. The key to addressing that skepticism was creating a project that was driven by business needs and not by IT, he said.

The UNDP decided to adopt software from Pleasanton, Calif.-based PeopleSoft about a year ago because it felt it was the best fit and offered the most accessible user interface for a global, multicultural organization.

The decision to outsource was made after assessing the cost of building an in-house system, with hardware alone costing in excess of $15 million. On top of that were software licensing costs. Moreover, the IT staff didn't have the skills needed to manage these systems, Sanders said.

A Unix platform was selected because Sanders didn't believe Wintel could scale. Sun Microsystems servers were selected as the hardware for the ERP system because the UNDP already had experience with Sun and sought "to leverage whatever strengths we already have," said Sanders.

The PeopleSoft development work is being undertaken by Cap Gemini Ernest & Young's Kansas City offices. On Oct. 31, a "gold copy" of the application will be moved to the outsourcing facility in Phoenix, with any subsequent application changes being made there, said Sanders.

He said the only technical issue he's concerned about is the potential for latency where satellite links are used.

Amy Mizoras, an analyst at IDC in Framingham, Mass., said the UN's motivations for moving to an ASP fit a classic scenario. But relatively few companies are moving to an ASP model, in part because there's no catalyst such as a Y2k upgrade pushing them to do it. **41690**

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FRANK HAYES ■ FRANKLY SPEAKING

Squandered Trust

WHAT WERE THEY THINKING? What insanely stupid impulse possessed the people at VeriSign to hijack the Domain Name System? This is a system built on trust. The U.S. government has entrusted VeriSign with control of root domain name servers. Everyone else has trusted VeriSign to deliver accurate domain name information using well-understood DNS standards.

Now VeriSign has flushed that trust down the toilet by breaking those standards and diverting DNS requests to its own Web pages.

VeriSign hopes to get $150 million a year in advertising revenue with its new "service." The rest of us get e-mail problems, broken network applications and a war of the work-arounds.

Yes, it *is* that bad. And no, VeriSign's new Site Finder "service" isn't just another innocuous search engine for fumble-fingered Web surfers.

Sure, users who type a misspelled Web address into Microsoft Internet Explorer or Netscape Navigator are redirected to a Microsoft or Netscape Web page intended to help them out.

But that's built into those Web browsers. VeriSign's gimmickry actually hijacks the entire DNS. Anytime *any* domain name request turns up a blank, instead of returning a name error the way it's supposed to, VeriSign's gimmick sends its own IP address.

Which means VeriSign's redirection affects *everything* that uses an Internet address. Such as e-mail. And networked printers. And Web services. And any networked application that depends on DNS working the way it's supposed to work.

And now, thanks to VeriSign, a lot of them are broken. And it's likely to cost a lot more than $150 million if even a fraction of them have to be modified to work around VeriSign's gimmickry.

Of course, redirecting Internet traffic this way at the DNS level would be clearly illegal if anyone else did it. But we trusted VeriSign with control of root domain name servers. And because VeriSign is abusing that trust rather than hacking into DNS servers, it may or may not be legal. At least two lawsuits have already been filed over VeriSign's gimmicked DNS, but there doesn't seem to be any way to get VeriSign to stop immediately.

So instead, we're seeing work-arounds for VeriSign's gimmicked DNS. The Internet Software Consortium, which makes the widely used BIND utility for resolving domain names, now offers a new version that can block the VeriSign gimmick and make DNS work the way it's supposed to. At least for the people whose DNS servers use that version of BIND.

But we know what to expect next, don't we? That's right: a VeriSign work-around to the BIND work-around.

And instead of having a clean, efficient, predictable and reliable DNS — a system we can trust — we'll have a patchwork of dueling work-arounds. And network applications that work on some parts of the Internet but not on others. And a lot more potential security holes — and a lot less reliability.

Enough already. This isn't VeriSign's system. It's ours. VeriSign controls those root domain servers only because it has a contract with the Internet Corporation for Assigned Names and Numbers (ICANN). VeriSign has demonstrated that it can't be trusted with the DNS. It's time to strip VeriSign of that contract.

True, VeriSign's contract is supposed to run until 2007. But the contract is subject to oversight by ICANN and the Commerce Department. And if VeriSign won't do what it was contracted to do — provide a stable, reliable DNS — it should get out of that business.

VeriSign can still be a domain name registrar. That's a place where VeriSign can focus on trying to make money without being in a position of trust.

But as for the root DNS servers, it's time to take them away from VeriSign — and put them into the hands of someone worthy of our trust. **41642**

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at **frank_hayes@computerworld.com**.

SHARK TANK

Cubed and Uncubed

This company's new policy makes departments pay for office space by the square foot. So IT staffers are hustled out of their offices and wedged into cubicles, grouses pilot fish. Then headquarters makes noises about getting rid of the cubes. "We actually thought we'd get our rooms back," fish says. "But we ended up losing our cubicle walls – 'Open office space is good for teamwork,' they said – and more than half the cubicle area. Some improvement."

He Lives

"I know you'll think I'm crazy, but Elvis keeps crashing my computer," this user tells support pilot fish. And she's right – when she puts a CD-ROM in the drive, the screen turns blue, and Elvis starts singing. Fish finally figures it out: "Apparently, she put an Elvis CD in the drive on top of another CD, and it got stuck on the plunger of the CD-ROM drive," he sighs. "When she took out any CD, Autorun worked its magic, and the King lived again."

The Best of Both Worlds

University professor gets a promotion and decides he needs two new computers, reports IT pilot fish: "One a PC, and one a Unix machine 'for his research.' " But the prof just uses the PC occasionally for e-mail and never logs into the Unix box. "We knew that would happen," fish says. "So we quietly arranged for the Unix machine to be a back-end processor for Web applications. Thus, the cycles aren't entirely wasted, and the muckety-muck gets his fancy computer."

Worth A Try

Navy IT pilot fish is tapped to figure out why the network for this training center slows to a crawl every morning at 9. It's fine, insists the chief petty officer who runs the network. The problem? Turns out the chief starts each day with a complete virus scan and backup of the network. Fish orders an after-hours, automated virus scan and backup. But it won't work unless you do it manually, chief objects. Then stay late to do it, directs fish. Result: "He decided to try the automated process," fish says.

Alien Concept

The point behind this big video presentation is internal network security, says a pilot fish in the audience. "The chief network security officer stressed that only business-related software was allowed to run on *any* corporate computer, and software downloaded from the Internet was prohibited." But in the video, dozens of monitors are clearly visible in the background, says fish – "all of them running the SETI-home screen saver."

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it runs through your entire company changing the shape of everything
in its path connecting it from one end to the other
a

river

that leads into

a sea of information
a river that propels you past obstacles past limitations
past the competition past what you thought was possible